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Headline Series

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NO. 218

HOW MANY PEOPLE?

A SYMPOSIUM



How Many People?

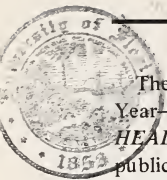
A Symposium

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December 1973

Number 218



Editorial Note

The advent of 1974—designated by the UN as World Population Year—furnishes the occasion for the appearance of this *HEADLINE SERIES*; but the more compelling reason for its publication lies in the increasing urgency of the world population problem.

That problem confronts mankind with the challenge it must meet, because, as William H. Draper, Jr. suggests in the introduction to this symposium, “except for the potential horrors of nuclear war, the population explosion poses the greatest single threat to our modern civilization.” What the challenge is and how to deal with it constitute the themes explored by the contributors in the following pages.

We are deeply grateful to the Population Crisis Committee and, in particular, its executive director for their assistance in the preparation of this *HEADLINE SERIES*.

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The Challenge We Must Meet

by William H. Draper, Jr.*

The coming of peace in 1945 hopefully marked the end of an era in human history—the era of gradually larger and larger conflicts involving more and more peoples in greater and greater devastation and death. As peace came to the world, another era was already getting under way—the era of the world's population explosion, one that will perhaps prove equally fateful for all of us.

Quietly, unobtrusively, and almost unnoticed, the world's population was growing at the rate of 50 million additional people a year at war's end, and was already more than 2.25 billion in total.

Since 1945 a single generation has passed—28 short years—a mere page in history. And yet in that short time an addition of more than half of those then living has been made to the human race—another 1.5 billion people. Today a grand total of 3.8 billion human beings inhabit the earth. And currently, in 1973, we are adding 75 million more each year; over 6 million a month; 200,000 each and every day!

Only a decade ago man began to realize his present dilemma. For

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generations he had fought hunger and disease and plague to maintain his very existence. Now he had increased production, conquered disease and extended his own life span only to find his own numbers increasing so fast that they threatened to pollute the environment and even to exhaust the world's food and other resources vital for life, resources which had always before seemed infinite.

And if we look only another generation to the future—27 more years to the end of this century—and assume continuance of the world's present annual growth rate of 2 percent—then about 6.5 billion people would crowd this earth.

Even today, more than half of the world's population lives in poverty and is hungry and undernourished. The situation at century's end, when nearly 3 billion more human beings are actually added, can be only one of greater poverty, misery and semistarvation for much of the world. Not a happy prospect!

Except for the potential horrors of nuclear war, the population explosion poses the greatest single threat to our modern civilization today. This warning has been given before, but it cannot be repeated too often. It must be taken seriously and drastic action taken soon by the governments of the world, or it will be too late.

Can the problem still be solved? Or is the momentum of growing numbers now so rapid that it cannot be stopped? Of course, we can and must solve the world population problem. The human race has always had to struggle with nature and the environment and the animal kingdom to survive. It is just because man has been so successful in overcoming the many obstacles that faced him and increasing his life expectancy that he now faces this new problem of too much population too quickly. People are now beginning to understand in most countries that the reduced deathrates of today must be matched by comparably lower birthrates if the quality of life that has now been achieved is to continue.

And a good start has been made! Only a decade ago, the International Planned Parenthood Federation, which was active in the private sector, had but \$1 million of annual budget to help the

family planning programs in a few countries. Now the federation has Family Planning Associations in 80 different countries, has been able to allocate over \$30 million this year and its resources should reach \$40 million in 1974.

For almost four years, the United Nations Fund for Population Activities has been actively assisting member governments who ask help for their family planning and population programs. Already 50 countries have contributed over \$100 million to this UN population fund, and some 70 developing countries have asked for and received help from the fund.

Today, an estimated \$400 million a year is being spent in the developing countries to deal with their population problem. Perhaps one-half of this is furnished by the internal budgets of the developing countries. The other half represents foreign aid assistance from the so-called developed world, made available bilaterally from country to country, as well as multilaterally through the International Planned Parenthood Federation and the UN Fund for Population Activities.

However, far greater priority for family planning must be given by governments generally and far greater overall resources must be made available if the population bomb is to be defused in time to avoid catastrophe. Also, it will take far greater understanding by couples throughout the farming areas and the country districts of the developing world of the advantages of the smaller family for a better life.

An effective and comprehensive governmental family planning education and service program would cost something like \$1 a year per capita for the entire population. The People's Republic of China, however, appears to be the only developing country which is yet attempting such a broad universal program as a priority part of its universal health service, and we do not know what China is spending.

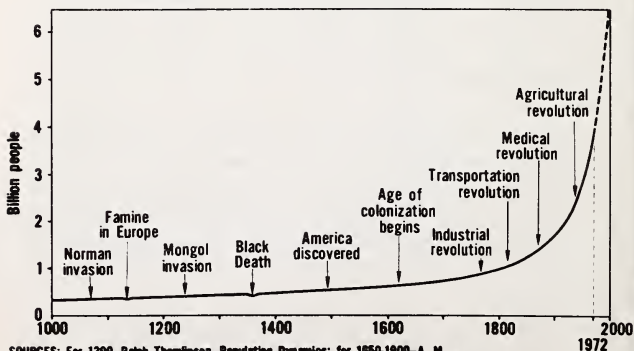
Aside from China, the developing world now numbers about 2 billion people; so the needed program in those countries would probably cost about \$2 billion a year—or five times what is now

being spent. Therefore, the available resources to deal with the world population problems effectively should steadily increase by the necessary five times in the next decade. While \$2 billion a year is a sizable sum, it still is only one-tenth of 1 percent of the world's current gross national product! Hopefully the necessary understanding, common sense and motivation will prevail to reduce family size.

This reduction in family size has already occurred in all the European countries, in Russia and Japan, and in Canada, Australia and the United States. The 1 billion people in those countries now average less than 1 percent a year population growth rate, and that average rate is still declining.

The developing world, in its own social, economic and political interest, has begun during the past decade to understand and to deal constructively with its own more serious and difficult population problem. The writer is convinced that the die is cast and that during the coming decade most of the developing world will also be well on its way toward a sensible and humanitarian solution.

Ten Centuries of World Population Growth



SOURCES: For 1300—Ralph Thomlinson, *Population Dynamics*; for 1850-1900—A. M. Carr-Saunders, *World Population*; for 1950-2000—United Nations data; other estimates by SESA/BUCEN/ISPC.

AID/PHA/POP 72-19

Environment and Population

by Thomas W. Wilson, Jr.*

The combined issue of environment and population inescapably raises the specter of a potential planetary doomsday. If present trends in population growth, urbanization, industrialization, energy use, resource depletion and environmental degradation continue, man plainly is doomed at some point to "overshoot" the carrying capacity of the biosphere. In a finite world there are limits *some-where* to the accumulated burdens that man can place on the natural system.

In the circumstances, it is difficult to dismiss outright the notion that the world could drift into a situation in which some form of disaster could strike too quickly for adequate response. Yet, the notion of planetary disaster is widely rejected—and for good reasons. A global collapse almost surely would be preceded by local or regional calamities serious enough to inspire the most complacent of still-viable societies to act in the interests of self-preservation.

Moreover, the trends in question are not immutable forces, but the products of policies, decisions, aims and actions of human beings who can, if they choose to, revoke or alter the direction or

*Thomas W. Wilson, Jr. is director of the Program on Environment and the Quality of Life at the Aspen Institute for Humanistic Studies.

pace of their activities. Projections of global disaster explicitly or implicitly must rest, then, on an assumption that political systems cannot or will not react in time to prevent a cataclysm on a world scale.

For these and other reasons, one can hypothesize with some assurance that the biosphere will not "collapse"—that the human race as a whole will not starve to death or otherwise commit mass suicide—that we will not completely "run out of energy"—and that we will not drown in our own garbage or come to a standstill in one paralyzing, suffocating traffic jam. The chances are that such happenings will remain subjects for satirists, that an instinct for survival will come into play before doomsday dawns.

But this hypothesis offers cold comfort. For one thing, we simply do not know what some of man's activities are doing to the environment and what an altered environment is doing, in turn, to man's health and welfare. Organic compounds and radioisotopes are being produced on an unprecedented scale—more than a thousand new substances now appearing each year. Many of them do not deteriorate through natural processes; some find their way into the global atmosphere and oceans; some are known to be harmful to human health and plant life. What we do not know is how toxic many of these substances are, singly or in combination, or by what routes and reservoirs they spread irreversibly through the environment. We only know there are limits beyond which human health must be affected adversely and world food supplies contaminated or limited.

For another thing, though we lack a satisfactory theory of climate, we know that man's activities already have affected climates on a regional basis. We know that this impact is increasing. And there is a growing belief among scientists that, on the present course, human activities inadvertantly will affect the global climate in a matter of decades with unpredictable results.

Or take the phenomenal increases in man's uses of energy. Energy use contributes to atmospheric pollution. Through the release of heat it creates perturbations which affect the climatè. Potential

"Hey
look, we
must be
getting
near
civiliza-
tion!"



Ulluschk in *Edmonton Journal*, Canada

Question for
the 70's?



Pierotti—Ben Roth Agency

world scarcities of energy fuels before the end of this century could place limits on man's activities, including the production of food, not to mention strains on the fabric of world community from competition between and among buyers and sellers of fuel supplies.

The relationships between health, energy, pollution and climate, on the one hand, and population levels on the other may be difficult to trace and impossible to quantify at the present time. The same can be said about the impact of growing populations on global supplies of minerals and other natural resources; there are too many variables in these pictures to be precise about cause and effect.

Fundamental Factors

But when one turns to the relationships between population and food, soil and water, the connection between human numbers and the carrying capacity of the natural system leaves the realm of reasonable dispute. Here we are faced not so much with short-term fluctuations but with fundamental, long-term factors, among them being these:

1. For all practical purposes, the colonization of Planet Earth has now been accomplished by man. There are no undiscovered parts of the world, no empty continents awaiting occupation, no place for large numbers of people to migrate beyond present frontiers to relieve internal population pressures.

2. Since the practice of agriculture began about 10,000 years ago the steadily growing production of food was achieved, until the very recent past, almost entirely by increasing the areas of land under cultivation. There are very few areas of arable land today that might add to the world's future food production and most of these are in tropical zones with dubious capacity for sustained productivity. Available land for cultivation and pasture has, in fact, been shrinking in recent years as a result of erosion through desert encroachment, overgrazing and other abuses.

3. Since about 1950, expansion of food production has relied very largely on intensified cultivation, which depends, in turn, on heavy application of fertilizers, pesticides, water and energy. Fertilizer

and pesticides have serious polluting and other side effects which place limits on their use; water and energy have their own side effects and besides are in increasingly tight supply.

4. The mechanization of agriculture has been, and remains, a primary force behind the massive migrations from rural areas to cities the world over. In most countries populations of cities are growing far more rapidly than total populations, and the growth of urban slums is even more rapid than the cities they surround. Migration and resultant urbanization, that is, the *distribution* of people, is a more severe "population problem" for many countries than is the increase in total numbers, not the least because very large percentages of urban in-migrants are without work. The resultant pressures on resources and social services are bound to get worse before they can get better.

In addition to these fundamental factors relating population numbers to the carrying capacity of the physical environment, there are disturbing recent developments: a decline in the world fish catch; a reduction in grain reserves to dangerous levels; rice shortages in Asia; rising food demands not only from population increases but from rising affluence in areas in passage to high consumption societies; a shift from buyers' to sellers' markets in critical foodstuffs; sharp distortions in traditional patterns of world food trade; the impact of widespread inflation; and signs of resurgent economic nationalism and restrictionism—not to mention such hopefully transient phenomena as droughts and the attendant starvation of people and animals. All these have potentially ominous implications for the balance between populations and planetary resources.

Technicians may disagree about data—about direct and indirect cause and effect relationships—about the potential role of new technology in relieving the pressures of man upon the natural environment. But at the United Nations Conference on Human Environment in Stockholm in 1972, the world community made plain its concern not only with nature's ecosystem, but with the *human* environment. More than a hundred governments assembled there

agreed that man has a "fundamental right" to "an environment of a quality that permits a life of dignity and well-being."

Social Context of Population Growth

In this light, population data, trends and prospects *as such* have no intrinsic values one way or another. They take on meaning only as they affect the declared right of mankind to "a life of dignity and well-being." This throws the question of population and environment into a social rather than a physical context and requires consideration of two major points:

First, the human environment for a majority of the present world population is far short of an acceptable quality as already defined by the world community in actions and declarations taken within the UN family of agencies over the past quarter of a century. Health standards are appalling; dietary levels rob millions of the capacity of self-development; educational systems cannot expand rapidly enough to embrace school-age populations; the absolute number of illiterates continues to grow; human settlements deteriorate; and the ranks of unemployed and underemployed are greater than ever and rising.

These are familiar facts. But the point here is that the internationally agreed objective is not to crowd the natural system to the brink of disaster before thinking twice, not to see how many people the earth can support without collapsing, not to struggle to expand food production to "keep up" with expanding populations at present levels of nutrition, *but to enhance the quality of the human environment*. Ideally speaking, every advance that mankind can make—in the production and distribution of food, as in every other way—should go toward that improvement of the human environment that governments have accepted as a fundamental right of mankind.

Second, it is close to a mathematical certainty that the total population of Planet Earth will continue to grow, rapidly and massively until it reaches a minimum of something on the order of twice its present size by sometime early in the next century—within

the lifetime of perhaps half of the people alive today. Such is the inexorable meaning of the age distribution of present populations: between four and five out of ten of all the people living in countries accounting for three-quarters of the world population have not yet reached their child-bearing years.

Most scientists agree that there are grounds for concern about the impact of the present level of human activities upon the climatic system, upon the capacity of human beings to absorb toxic materials released to the atmosphere and waters, upon planetary supplies of energy, soil, water and especially food, and perhaps upon still unsuspected outer limits to man's effects on the viability of the biosphere.

But in the context of the human environment—of the social goals aimed at lifting a majority of mankind from its present level of misery—the task of providing food, shelter, jobs, health and educational services for twice as many people assumes epic proportions far beyond disputed evidence about climatic effects, acceptable levels of toxicity, and such questions as substitutes for polluting and persistent pesticides.

Needless to say, the state of the human environment, embracing both the biosphere and the technosphere which man has created, depends primarily upon our capacity to manage the relationships between the human family and the natural systems of Planet Earth. So the simple and unanswerable question is: Can the social and political systems manage the impact of man's activities on the natural and human environments with a world population doubling within several decades?

Far short of some planetary disaster, then, it is not hysterical to foresee a future for much of mankind that is hungrier, dirtier, more crowded, more shortage-ridden, less healthy and more quarrelsome than it is today. Short of collision between man's activities and the physical outer limits of the biosphere lies the more credible specter of collapse or paralysis of the institutions through which human societies seek to manage their increasingly complex and crisis-prone affairs.

What Kind of Response?

Perhaps we should place modest hope in the mere fact that the UN convened the Conference on the Human Environment in 1972 and will convene the World Population Conference in the summer of 1974. The purpose of both conferences is to start charting directions for bringing the impact of man's total activities into a tolerable relationship with the natural system and, in this basic sense, both address the central problem of choice among alternative routes for mankind.

The convening of global conferences like these may be signs, then, that man is not prepared to sit idly by as calamity approaches nor to continue drifting deeper and deeper into problems that turn into unmanageable crises—that he will not, in fact, persist on a self-destructive course. These events can be seen as part of an emerging process in which the world community, represented by the UN, is working toward an enlarged capacity to face, assess and act upon the first truly global issues beyond war and peace: environment, resources and population.

The essential ingredient in this consultative process is the participation of governmental delegations, not to substitute for necessary exchanges among technical experts, but to raise the subject to the political level where policy can be debated and agreements reached.

The mere decision to hold such conferences forces governments to face up to some of their own policy issues so they can take positions in the world forum. It stimulates international agencies, especially members of the UN system, to relate their own specialized interests to broader issues. And it helps to mobilize nongovernmental organizations and expert groups to participate in the preparatory process and to be heard in the course of official proceedings.

At a minimum, such conferences, and the preparations for them, can contribute to an expansion of awareness that the cooperative way of life among nations has become not merely desirable but an imperative for the survival of a world worth living in.

Moreover, such meetings at the political level are not oneshot

affairs to be forgotten as delegates head home for their capitals. They can set in motion an on-going process of cooperative work, not only in areas on which agreement has been reached but in the further study and refinement of issues which elude early agreement. The Stockholm conference produced a 109-point plan of action for continuing cooperation in the field of the environment, and the population conference is charged with the elaboration of a world plan of action in that field.

This new dimension in the work of the world community is further manifested by the Conference on the Law of the Sea, including an international regime for the seabeds, scheduled to convene late in 1973, and by the conference on human settlements, called under UN auspices for 1976.

This process of study, exposure, debate and action is the first, hesitant response at the international level to the prophets of doom. It is not hyperbole to suggest that man's fate may be riding on the quality of that response as it takes more definitive form.

Development, Social Justice and Smaller Families

by James P. Grant and William Rich*

Combining economic growth with the more equitable distribution of the economic and social benefits of progress and easier access to family planning services can bring about a much greater and more rapid reduction in fertility than any one of these policies alone. Recent evidence increasingly suggests that such programs are desirable and probably necessary "allies" if population stabilization is to be achieved in the foreseeable future in most low-income countries.

This conclusion has far-reaching implications for all persons concerned with the need for controlling the population explosion and for achieving population stabilization at the earliest possible date. In many developing countries it means that effective land reform programs may rank close to, or exceed in importance, the implementation of vigorous family planning programs in terms of effect on reducing rural birthrates, and that both may be required if there is to be a dramatic reduction in birthrates. For inhabitants of rich countries, such as the United States, which desire to help reduce birthrates in developing countries as well as in their own, support of

*James P. Grant is president of the Overseas Development Council. William Rich, currently at the Stanford University Law School, is a former associate fellow of the Overseas Development Council.

those trade and aid policies which encourage development may be even more important than support of family planning programs.

Much writing and research have been devoted to the adverse effects of rapid population growth on human well-being. The population explosion is the principal reason why, despite historically unprecedented increases in national output in recent years, most less-developed countries have minimal improvement in per capita income, growing unemployment, a continued high level of illiteracy and poor health, a widening income gap between the poorest half of their population and those relatively well-off, and increasingly serious environmental problems.

Breaking Out of the Vicious Circle

Far less attention has been given to the consequences of different patterns of development on birthrates. Demographers have long known, of course, that with sufficient economic progress, as in Europe and North America, high birthrates fall sharply. But since the reduction in births in the West occurred over a period of more than 50 years and at relatively high income levels, it seemed to have little relevance to most developing countries. Demographers also have generally recognized that widespread poverty tends to sustain high birthrates for the obvious reason that families living without adequate employment, education or health care have little security for the future except for reliance on their children. Despite the major reduction in deathrates in the past two decades, many persons in poor countries still perceive—often rightly so—that having numerous children is advantageous, both for immediate social and economic reasons and because of the persisting risk that offspring will not survive to adulthood. These high birthrates, in turn, merely make social problems worse.

The crucial question, therefore, is how the great majority of families can break out of this vicious circle. Recognizing the fact that their social and economic difficulties worsen every day that population growth continues unrestrained, many developing countries have begun family planning programs to improve means

of limiting family size. But a troublesome problem remains: these programs have for the most part been accepted by families which are relatively affluent or already have too many children, or by women in ill health. Unless there is greater acceptance of the need for fewer children by the *majority* of families, efforts to stabilize population growth will fail. Therefore, if developing countries are to escape the threats posed by rapid population growth, more families must not only be provided with means to limit births but also acquire the motivation to do so.

The experience of Europe and North America during the past century—a general reduction in birthrates after incomes became relatively high—was long thought to be the norm, in the absence of family programs, for poor countries as well. However, there now is striking evidence that in an increasing number of poor countries, as well as in some regions within countries, birthrates have dropped sharply despite relatively low per capita income and despite the absence or relative newness of family planning programs. Preliminary examination of societies as different as China, Barbados, Sri Lanka, Uruguay, Taiwan, the Indian Punjab, Cuba and South Korea suggests a common factor. In all of these countries, a large portion of the population has gained access to modern social and economic services—such as education, health, employment and credit systems—to a far greater degree than in most poor countries or in most Western countries during their comparable periods of development. Not only have birthrates dropped noticeably in most of these countries before introduction of major family planning programs, but such programs seem to be much more successful in those countries which have assigned high priority in their development programs to a more equitable distribution of income and social services.

Development Strategy

Currently, rapid population growth is widely regarded as a basic threat to the continued adequacy of the world's resource base. Expectations of doom if population growth goes unchecked have led

some to assign less immediate importance to other aspects of development programs, particularly health and nutrition. It has been suggested that population growth must be slowed before the welfare of much of the world's population can be improved significantly.

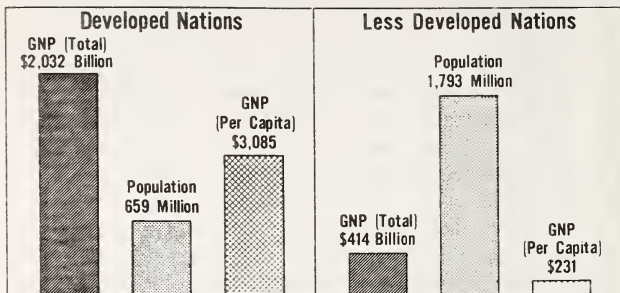
Yet there is increasing evidence that social and economic development is an important, perhaps even essential, condition for reductions in births. There is also evidence that the very strategies which cause the greatest improvements in the welfare of the entire population also have the greatest effect on reducing population growth.

The relationship between socioeconomic change and fertility is admittedly complex and not reducible to a simple formula. In every country there are variations in cultural or religious factors which have some implications for population growth. Additional variations are due to the means available for reducing births.

There are many reasons why birthrates are affected by improved welfare. The spread of education contributes to the motivation for reduced family size. Education and literacy make information about birth control techniques more accessible. More important, changes which occur in the norms and values of educated persons as they learn to question traditional practices of their parents affect their attitudes toward family size. The correlation between small family size and female education is particularly high; as women gain independent social status, they become increasingly active outside the home and are inclined to limit family size as a result. Moreover, extended education tends to delay marriage. It also generally lengthens the period during which the child is dependent on parental support. As education becomes available—at some cost—many parents will have to decide whether to have fewer children with or more without an education.

While it is true that health services, accompanied by improvements in nutrition, sanitation and education, have helped to reduce deathrates, it is also certain that expanded health services contribute, albeit more slowly, to birthrate reduction. These services

Economic Status Related to Population



1970 gross national product for non-Communist countries.
Calendar year 1970 in current market prices.

Source: AID.

offer a natural springboard for family planning programs. Even more important, in many countries high survival rates must be assured before it can be expected that births will be limited. In many parts of India, for instance, where social, economic and religious factors virtually require having a son alive at the time of the father's death, it is still necessary to bear six children to be relatively certain that one male will survive. Under such conditions, improvements in child survival are a likely precondition of the acceptance of family planning.

Availability of employment is another factor which, at least indirectly, influences the birthrate. For several reasons, fulltime employment is often the key to other opportunities for improved welfare. When only marginal employment is available—such as peddling in the cities or harvest work in rural areas—then families may consider it necessary to have as many children as possible to contribute to family support. On the other hand, if women can find jobs, they are more likely to postpone having children, or decide to

have only one or two. Sending children to school instead of to income-producing work can also affect motivation for family size. As child labor practices change, the cost of rearing children increases.

The development factor which may do the most to create an environment conducive to planning for smaller families is the expansion of a variety of interests and satisfactions beyond the traditional family. A couple living in poverty, without fully productive jobs, without economic and social aspirations or a sense that they can contribute to the progress of the society, may well find childbearing and rearing the most important and rewarding experience in life. The perception by both women and men that one can improve one's well-being, or that of the whole community, will not in itself change the value of having children. However, such additional routes to human satisfaction may influence this particular motivation for having large families.

This brief description of some of the factors associated with fertility indicates the complex interrelationship of socioeconomic factors with the birthrate. Every family faces its own set of perceived social or economic alternatives as well as a wide range of fertility decisions. At this stage it certainly is not possible to define the relationship between development and population growth in precise mathematical terms. Research has made it possible, however, to focus on the general shape of this relationship. As individual families make decisions affecting family size within a range of alternatives, these decisions can, in turn, be related to the distribution of socioeconomic goods or services among the population.

Educational Levels and Fertility

A look at the relationship of education levels to fertility illustrates this approach. In most developing countries, the majority of the population has little, if any, education, and the birthrate is high. Changes in family size among those who are relatively more educated cannot be expected to have much effect on the population growth rate, because this small segment of the population already

shows a lower than average number of births per family. The accompanying table illustrates the continuum of educational and fertility levels in one rural area:

**The Relationship between Educational Level
and Fertility in Cauquenes, Chile**

Education Level of Women Interviewed	Average No. of Births Per Couple	Percent of Population
No formal education	4.86	20.2
Some primary school	3.40	48.3
Complete primary school	1.26	13.1
Some secondary school	1.21	14.4
Complete secondary school	1.69	4.0

Source: Carmen Miro and Walter Mertens, "Influences Affecting Fertility in Urban and Rural Latin America," *Millbank Memorial Fund Quarterly*, July 1968, page 105.

The pattern found in this area of Chile is typical of that found in many parts of the world. The 68 percent of the adult population without primary education in Cauquenes has 87 percent of the children in the village area. Reductions in population growth must result from changes which affect this group.

Only when a large portion of a national population gains access to modern social and economic services—such as education, health, employment for women or credit for modern farming techniques—are changes in family size likely to follow. The target group for such development efforts is illustrated vividly by those in the low education groups of rural Chile. When a large group such as this is affected by appropriate developments, then reductions in the total national birthrate are likely to follow. This is consistent with experiences of demographic transition throughout the world; those countries in which the majority does not have access to modern goods and services show high birthrates.

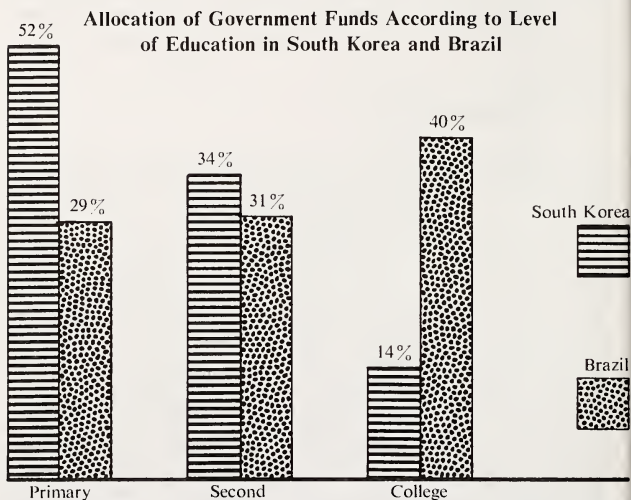
For smaller families, the effect on motivations of any single policy measure may not by itself be of great significance—just as no single change in a community is likely to cause many parents to further limit their family size. But development policies that focus on

participation and increased access to benefits for the population as a whole do seem to produce a major impact on family size. In countries which follow development policies that result in a relatively equitable distribution of health and education services, and provide land, credit and other income opportunities, the cumulative effect seems to be that the poorest half of the population is vastly better off than it is in countries with equal or higher levels of per capita gross national product (GNP) but poor distribution patterns. This has helped make it possible for such low-income countries to reduce birthrates to a level not reached in most countries until much higher national per capita incomes had been attained.

Some Empirical Examples

Alternative ways of delivering social services figure importantly in determining whether or not a development policy has significant impact on the low income—and high birthrate—majority of the population. The contrast in health systems between Sri Lanka and Turkey (or between China with its “barefoot” doctors, on the one hand, and Brazil and Mexico, on the other) demonstrates extreme differences in the delivery of health services. Both Sri Lanka and Turkey, for example, devote about the same level of per capita public funds to health services. In Sri Lanka, however, the emphasis has been on training paramedics, who have delivered basic modern health care to the entire rural and urban population. The improvements in national health in the last two decades have been dramatic. In Turkey, on the other hand, efforts have been made to copy Western health systems. While affluent urban families obtained readier access to a modern hospital and a well-trained doctor, in most rural areas there still were more than 10,000 residents per doctor, and few paramedics were available to supply minimal health services. The infant mortality rate remained over twice as high as, and life expectancy much less than, the comparable figures for Sri Lanka, despite Turkey’s far higher per capita income. Turkey’s birthrate remains at a high level.

Education strategies also differ widely in South Korea and Brazil, as the following graph illustrates. Public expenditures in South Korea make the educational system in that country accessible to a wider segment of the total population than in Brazil. In 1970 two-thirds of South Korea's population of children aged 5 to 14 were in primary school, while in Brazil only half of the same age group were in school despite that country's higher per capita income.



Brazil Data: *Publicacion Anuario Brasileiro de Educacao*, 1964, published by Brazil's Ministry of Education and Culture, 1966, page 29.

Korea Data: *Social Development*, 1970, published by the South Korean Ministry of Health and Social Affairs, 1970, page 233.

In agriculture, alternative strategies may be successful in increasing production but have vastly different social consequences. Both Taiwan and Mexico have enjoyed the benefits of the Green Revolution, the agricultural breakthrough which has yielded vast

increases in grain production. In Mexico, however, improved wheat harvests have contributed relatively little to alleviating rural poverty. In 1960 over half of Mexico's total agricultural output was produced on only 3 percent of its farms. This same 3 percent accounted for 80 percent of the increase in agricultural production between 1950 and 1960. Owners of large-scale, capital-intensive, irrigated farms were by far the largest beneficiaries of the new wheats. In a ten-year period the number of landless laborers increased 43 percent, while the average number of days worked each year dropped from 194 to 100.

In Taiwan, on the other hand, land reform has put strict 7.5 acre limits on individual landholdings. The average farm has only about 2.2 acres. There is also an extensive system of farm cooperatives to provide credit, markets and new technology. As a result, small-scale rice farmers have been able to take advantage of the new crops; they have almost doubled their output in the past 20 years, while at the same time providing more employment for rural dwellers. Farms in Taiwan now average five times as many workers per 100 acres as those in Mexico, and their output of food grains per acre is nearly treble that of Mexico.

Cultural, geographic and political conditions in Taiwan and Mexico are vastly different. The impact of these various factors on birthrates is unclear. The differences in development strategies, however, certainly appear to be linked to differences in family size.

A country which distributes goods and services on an equitable basis can bring about improvements in the welfare of the relatively poor on a wide scale even if its total resource availability is low. Thus, in Taiwan, average incomes are relatively well distributed, health services have extended throughout rural areas, and effective primary education is accessible to virtually all of the population. In Mexico, although average income is almost double that in Taiwan, the distribution of benefits is more limited, other social services also appear to be poorly shared, and the total welfare of the poorest groups is extremely low. As a result, the income of the poorest 20 percent of the population is higher in Taiwan than in Mexico, and

the "real income"—which would include measures for health and education—is noticeably higher in Taiwan.

Keeping in mind these differences in the distribution of income and services, it is interesting to note that in Taiwan the birthrate dropped from 46 per 1,000 in 1952 to 31 in 1963, at which time a vigorous family planning program was introduced. It continued falling thereafter to 26 per 1,000 in 1970. In Mexico, on the other hand, the birthrate only declined from 44 per 1,000 to 42 per 1,000 during the period 1952-70. While the birthrate is declining for a few areas of greatest progress, this trend has not yet affected the majority of the Mexican population.

A contrast between South Korea and Brazil further illustrates how alternative development strategies affect birthrates. The following table presents selective indicators of conditions in the two countries for comparison:

**Comparison of Living Conditions in
South Korea and Brazil, Selected Indicators**

		South Korea	Brazil
Population growth rates	1958.....	3%	3%
	1964.....	2.7%	2.9%
	1971.....	2%	2.8%
Income per capita (1971).....		\$280	\$395
GNP growth rates in the 60's.....		9%	6%
Ratio of income, richest 20% to poorest 20% (1970).....		5 to 1	25 to 1
Literacy (1970).....		71%	61%
Infant deaths per 1,000 births (1970).....		41	94
Joblessness.....		negligible	serious
Effective land reform.....		Yes	No
National family planning program.....		Yes	No

In South Korea, as a result of socioeconomic improvements, the birthrate dropped from 45 per 1,000 in 1958 to 38 per 1,000 in 1964, by which time a family planning program had been implemented. The birthrate continued to fall thereafter, to about 30 per 1,000 in 1971, which reduced the population growth rate to approximately 2 percent. In Brazil, on the other hand, the birthrate only declined

from about 42 per 1,000 to 38 per 1,000 during the period 1958-71. As in Mexico, this trend has not affected the majority of the population. Highly uneven distribution of income and social services, religious constraints and a lack of government support for family planning programs have all contributed to the maintenance of Brazil's high population growth rate.

The experience of recent years indicates quite clearly that these more equitable approaches to development, which are so beneficial in increasing the motivation for smaller families, need not be at the expense of economic growth. In fact, those development strategies which provide social justice through making it possible for a farmer or a laborer to work more effectively for his own advancement can actually accelerate growth. Even though this conclusion runs counter to much current thinking, it should not be too surprising. If 20 percent of a poor country's rural labor force is idle, a labor-intensive agricultural strategy putting the unemployed to work should increase production; and the provision of basic education and health services to farmers generally should increase production further—as well as improve the motivation for smaller families in the rural sector.

The Development-Motivation-Fertility Thesis

Some objections that have been raised to this thesis should perhaps be noted. The facts that high population growth rates continue most dramatically in Latin America despite the region's relatively high per capita incomes, and that the most successful examples of rapidly declining birthrates in countries with low per capita incomes are in East Asia have led many to say that Catholicism is the dominant reason for the former and that Chinese cultural attributes are responsible for the latter.

Obviously, religious and cultural factors have some impact on attitudes toward family size; it must not be forgotten, however, that comparable policies and programs have been shown to have roughly comparable effects in different religious and cultural settings. Thus, the education example of Cauquenes, Chile, cited earlier, indicated

a significant correlation between education and fertility in Catholic Chile, just as it does in the East Asian countries. Similarly, we know that Catholic France has long had low birthrates, and that the relatively more prosperous Catholic north of Yugoslavia has a significantly lower birthrate than Yugoslavia's much poorer Muslim south. With regard to the alleged greater Chinese cultural willingness to shift toward smaller families, it bears remembering that similar improvements in education, health, income and jobs have apparently had roughly comparable effects on the Sinhalese in Sri Lanka, Indians and Tamals in Singapore, Blacks in Barbados, Cubans and Uruguayans in Latin America and Punjabis in India as they have had on the Chinese in East Asia. There is need for much more research on the impact of cultural and religious factors on birthrates. But it is now amply clear that improved availability of jobs, income and social services significantly affect attitudes toward family size in virtually all societies.

A Role for the U.S.

While the most basic initiatives and decisions relating to both poverty and population growth must necessarily be made by the poor nations themselves, the policies of the rich nations of the world clearly can affect the progress of the poor countries along the development-motivation-fertility continuum.

The rich countries—and particularly the United States—can play an extremely useful research and support role in this area. An outstanding example of what such outside assistance can do was provided by the sequence of external efforts that led to the Green Revolution: the early identification of the food crisis of the mid-1960's, followed by the work of the Rockefeller and Ford foundations in developing new high-yielding grain seeds, and the subsequent large-scale financial support by the U.S. Agency for International Development and other organizations to facilitate the massive introduction of these new seeds and related technology in many countries. External assistance clearly played a very important role in bringing about the Green Revolution.

The developed countries, particularly the United States, have already made a significant contribution to the population field. Much valuable work has been carried out to improve birth control techniques and to focus attention on the population problem; considerable financial support has been forthcoming for family planning programs in those poor countries that have requested foreign assistance; and the prospects—and justification—for increased financial assistance to these programs seem excellent.

However, if the global population explosion is to be effectively checked, the United States and other developed countries must launch far more vigorous efforts on two other principal fronts. First, a major increase in the transfer of resources from rich countries to poor is needed to help the latter accelerate development. It is no accident that, with the exception of China, most of the development—and family planning—"success stories" have taken place in societies with broad access to external resources. But there must also be major changes in the ways rich countries relate to the poor countries if there is to be anything like the needed increase in the transfer of resources in the 1970's. Additional sources of foreign exchange must come from trade, investment, aid and, possibly, from such new global sources as the raw materials of the seabed and the foreign exchange made available by the International Monetary Fund through the Special Drawing Rights mechanism.

Second, the developed countries must attempt to insure that the transfer of resources takes place in ways that facilitate rather than deter improved distribution of services and employment patterns in the less-developed countries. When asked to do so, the rich countries can assist in building those institutions that will favorably affect the distribution of income. Land reform, credit institutions and cooperatives are among the elements of such an approach. Effective support should be provided for programs giving all women and men access to at least a primary level of education and to rudimentary health services. Care should be taken to avoid simply exporting Western health and education systems, but rather to encourage the development of programs suited to local conditions. To develop

applicable systems of health care and education, both rich and poor countries should begin a systematic review of some of the more successful programs in these areas that are already in operation in countries as ideologically different as Sri Lanka, Taiwan and China.

Conclusions

If the developing countries are to escape the threat posed by rapid population growth within an acceptable time period, more families must acquire the motivation to limit births. It is not enough for them simply to be provided with the improved means to do so. This means development planners must give far more attention to the effect of alternative development strategies on birthrates. Equally important, those concerned with alleviating population problems need to think of remedies for the population crisis which go beyond exclusive reliance on family planning programs to include the larger context of the development crisis—to consider the possible ways of treating the basic “disease” of poverty and, by doing so, creating the needed motivation for smaller families. Policies that bring health, education and meaningful jobs to lower income groups can at the same time contribute toward reducing population growth and accelerating economic growth, and can thus provide a solid base on which to build future development policies. These policies, when combined with large-scale, well-executed family planning programs, should make it possible to stabilize a developing country’s population much more rapidly than reliance on either approach alone.

Even if more effective ways are found to limit births—such as a perfect contraceptive readily available—other problems of development must still be addressed. While the better distribution of opportunities for improvement has been represented as an approach that is likely to reduce population growth, it is also likely to reduce malnutrition, poor health and unemployment. This complementary relationship is more than just incidental; it is the key both to the adoption of appropriate policies and to making available the financial resources needed for such policies. There is still much to be learned about the direct relationship between the distribution

of opportunities and overall birthrate reduction. There is sufficient evidence, however, to understand the basic direction that policies should take. Although there is certainly no sign of easy solutions, it is possible to move ahead on policies that are of basic importance to the improvement of human welfare. "Growth with justice" may well be an indispensable key to the reduction and eventual stabilization of population growth.

Population and Affluence: Growing Pressures on World Food Resources

by Lester R. Brown*

During the 1960's, the world food problem was perceived as a food/population problem, a race between food and people. At the end of each year observers anxiously compared rates of increase in food production with those of population growth to see if any progress was being made. Throughout most of the decade it was nip and tuck. During the 1970's, rapid global population growth continues to generate demand for more food, but, in addition, rising affluence is emerging as a major new claimant on world food resources. Historically, there was only one important source of growth in world demand for food; there are now two.

At the global level, population growth is still the dominant cause of an increasing demand for food. Expanding at about 2 percent per year, world population will double in little more than a generation. Merely maintaining current per capita consumption levels will therefore require a doubling of food production over the next generation. In demographic terms the world currently divides essentially into two groups of countries: the rich countries, that have low or declining rates of population growth, and the poor countries,

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most of which have rapid rates of growth. Fully four-fifths of the annual increment in world population of an estimated 70 million occurs in the poor countries.

Some of the relatively small poor countries add more to the world's annual population gain than the larger rich ones. Mexico, for example, now contributes more to world growth than does the United States. The Philippines adds more people each year than does Japan. Brazil adds 2.6 million people in a year, while the Soviet Union adds only 2.4 million.

The effect of rising affluence on the world demand for food is perhaps best understood by examining its effect on grain requirements. Grain consumed directly provides 52 percent of man's food energy intake. Consumed indirectly in the form of livestock products, it provides a sizable share of the remainder. In resource terms, grains occupy more than 70 percent of the world's crop area.

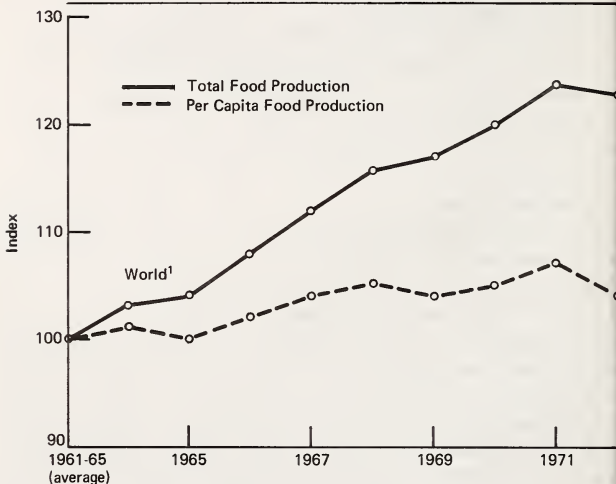
In the poor countries, the annual availability of grain per person averages only about 400 pounds per year. Nearly all of this small amount must be consumed directly to meet minimum energy needs. Little can be spared for conversion into animal protein.

In the United States and Canada, per capita grain utilization is currently approaching 1 ton per year. Of this total, only about 150 pounds are consumed directly in the form of bread, pastries and breakfast cereals. The remainder is consumed indirectly in the form of meat, milk and eggs. The agricultural resources—land, water, fertilizer—required to support an average North American are nearly five times those of the average Indian, Nigerian or Colombian.

Throughout the world, per capita grain requirements rise with income. The amount of grain consumed directly rises until per capita income approaches \$500 per year, whereupon it begins to decline, eventually leveling off at about 150 pounds. The total amount of grain consumed directly and indirectly, however, continues to rise rapidly as per capita income climbs. As yet, no nation appears to have reached a level of affluence where its per capita grain requirements have stopped rising.

The impact of rising affluence on the consumption of livestock products is evident in trends in the United States over the past generation. For example, per capita consumption of beef climbed from 55 pounds in 1940 to 117 pounds in 1972, more than doubling. Poultry consumption rose from 18 pounds to 51 pounds during the same period.

Total and Per Capita Food Production, 1961-72



Source: Department of Agriculture.

There is now a northern tier of industrial countries—beginning with the United Kingdom in the West and including Scandinavia, Western Europe, Eastern Europe, the Soviet Union and Japan—whose economic advancement and dietary habits more or less approximate those of the United States in 1940. As incomes continue to rise in this group of countries containing some two-thirds of a billion people, a sizable share of the additional income is being converted into demand for livestock products, particularly beef.

Many of these countries, such as Japan and those in Western Europe, are densely populated. Others—the Soviet Union, for example—suffer from a scarcity of fresh water. Thus they lack the capacity to satisfy the growth in demand for livestock products entirely from indigenous resources. As a result, they are importing increasing amounts of livestock products or of feedgrains and soybeans with which to expand their livestock production.

Throughout the poor countries, population growth accounts for most of the year-to-year growth in the demand for food. At best, only very limited progress is being made in raising per capita consumption. In the more affluent countries, on the other hand, rising incomes account for most of the growth in the demand for food. In Japan and France, for example, where population is growing at about 1 percent annually and per capita incomes at several percent, year-to-year growth in the demand for food derives principally from rising affluence.

Wherever population has stopped growing, as in West Germany, rising affluence accounts for all the growth in food consumption. In a country such as India, however, where income rises are scarcely perceptible and population continues to mount rapidly, nearly all the increase in demand derives from population growth. In Brazil, which has both rapid population growth and, in recent years at least, rapid growth in per capita income, both factors loom large in the increase in demand for food.

U.S. AGRICULTURE AND WORLD FOOD NEEDS

Over the past generation, the United States has achieved a unique position as a supplier of food to the rest of the world. Before World War II, both Latin America, particularly Argentina, and North America (including Canada) were major exporters of grain. During the late 1930's, net grain exports from each of these continents averaged about 5 million tons per year. Since then, however, the failure of most Latin American countries to reform and modernize

agriculture and the unprecedented population growth in the region have largely eliminated the net export surplus. With a few exceptions, Latin American countries are now food importers. Over the past three decades, North America has emerged as the world's breadbasket. Australia, the only other net exporter of importance, exports about one-sixth as much grain as North America.

The period since World War II has been characterized by excess capacity in world agriculture, much of it concentrated in the United States. Immediately following the war the United States made a unilateral decision to use its impressive food-producing capacity, which was expanded vastly in response to wartime demands, to intervene anywhere in the world whenever famine threatened. During the quarter century since then, the United States has been remarkably successful in staving off famine, even when one-fifth of the exportable U.S. wheat crop was required during 1966 and 1967 to feed some 60 million Indians over a two-year period.

Downward Trend for Grain Reserves

In many ways the world was fortunate to have, in effect, two major food reserves during this period. One was in the form of grain in the principal exporting countries and the other, in the form of cropland idled under farm programs, virtually all of it in the United States.

Grain reserves, including substantial quantities of both foodgrains and feedgrains, are most commonly measured in terms of carryover stocks—the amount in storage at the time the new crop begins to come in. World carryover stocks are concentrated in a few of the principal exporting countries—namely the United States, Canada, Australia and Argentina.

Since 1960, world grain reserves have fluctuated from a high of 155 million metric tons to a low of about 100 million metric tons. When reserves drop to 100 million tons, severe shortages and strong upward price pressures develop. Although 100 million tons appears to be an enormous quantity of grain, it represents a mere 8 percent of annual world grain consumption, an uncomfortably small working reserve and a perilously thin buffer against the vagaries of

weather or plant diseases. As world consumption expands, so should the size of working reserves; but the trend over the past decade has been for reserves to dwindle while consumption has climbed.

In addition, one-seventh of U.S. cropland, or roughly 50 million acres out of 350 million, has been idled for the past dozen years or so. Though not as quickly available as the grain reserves, most of this acreage can be brought back into production within 12 to 18 months.

In recent years the need to draw down grain reserves and to dip into the reserve of idled cropland has occurred with increasing frequency. This first happened during the food crisis years of 1966 and 1967 when world grain reserves were reduced to a dangerously low level and the United States brought back into production a small portion of the 50 million idle acres. Again, in 1971, as a result of the corn blight, the United States both drew down its grain reserves and brought another portion of the idled acreage back into production. In 1973, in response to growing food scarcities, world grain reserves once more declined, and the United States dipped into its idled cropland, but to a much greater degree than on either of the two previous occasions. Government decisions in early 1973 permitted all but a small fraction of the idled cropland to come back into production.

Since the end of World War II until recently, world prices for the principal temperate zone farm commodities, such as wheat, feedgrains and soybeans, have been remarkably stable. In part, this is because throughout much of this period world prices have rested on the commodity support level in the United States. Since world food reserves may become chronically low and the idled crop acreage in the United States may decline sharply or even disappear entirely in the years ahead, there is the prospect of very volatile world prices for the important food commodities. Indeed, in recent months prices of most principal foodstuffs have soared to historic highs. This situation could be made far more serious by a prolonged drought of several years, like those that have occurred roughly every 20 years in the United States, most recently during the 1950's.

CONSTRAINTS ON EXPANDING THE WORLD FOOD SUPPLY

The prospects for expanding the food supply depend on a wide range of economic, ecological and technological factors. The traditional approach to increasing production—expanding the area under cultivation—has only limited scope for the future. Indeed some parts of the world face a net reduction in agricultural land because of the growth in competing uses, such as industrial development, recreation, transportation and residential development. Few countries have well-defined land use policies that protect agricultural land from other uses. In the United States, farmland has been used indiscriminately for other purposes with little thought to the possible long-term consequences.

Some more densely populated countries, such as Japan and several in Western Europe, have been experiencing a reduction in the land used for crop production for the past few decades. This trend is continuing and may well accelerate. Other parts of the world, including particularly the Indian subcontinent, the Middle East, North Africa, the Caribbean, Central America and the Andean countries, are losing disturbingly large acreages of cropland each year because of severe erosion.

The area of land available for food production is important, but perhaps even more important in the future will be the availability of water for agricultural purposes. In many regions of the world, fertile agricultural land is available if water can be found to make it produce. Yet most of the rivers that lend themselves to damming and to irrigation have already been developed. Future efforts to expand freshwater supplies for agricultural purposes will increasingly focus on such techniques as the diversion of rivers (as in the Soviet Union), desalting sea water, and the manipulation of rainfall patterns to increase the share of rain falling over moisture-deficient agricultural areas.

The need for capital inputs, particularly in the form of chemical fertilizers and pesticides, is projected to grow at an unprecedented rate over the remainder of this century. If the United Nations medium population projection materializes by the end of the century

(giving the world a population of 6.5 billion), far more than doubling in the use of chemical fertilizer would be required, and the eutrophication of freshwater lakes and streams would become a far more serious problem than it is today.

One of the disturbing questions associated with future gains in agricultural production is the extent to which the trend of rising per acre yields of cereals in the more advanced countries can be sustained. In some countries, increases in per acre yields are beginning to slow down, and the capital investments required for each additional increase may now start to climb sharply. In agriculturally advanced countries, such as Japan, the Netherlands and the United States, the cost per increment of yield per acre for some crops is rising. For example, raising rice yields in Japan from the current 5,000 pounds per acre to 6,000 pounds could be very costly. Raising yields of corn in the United States from 90 to 100 bushels per acre requires a much larger quantity of nitrogen than was needed to raise yields from 50 to 60 bushels.

What impact the energy crisis will have on food production costs and trends remains to be seen. With a substantial rise in the cost of energy, farmers engaged in high-energy agriculture, as in the United States, will tend to use less, thus perhaps reducing future production increases below current expectations. For other inputs used in modern agriculture—nitrogen fertilizer, for example—the rising cost of energy can be important. In part, this is because one of the principal raw materials for the synthesis of nitrogen fertilizer is natural gas, and in part, because one of the dominant costs in manufacturing nitrogen fertilizer is energy.

Constraints on Protein Production

In looking ahead one must be particularly concerned about the difficulties in expanding the supply of world protein to meet the projected rapid growth in demand, which is now being fueled both by population growth and rising affluence. At present, mankind is faced with technological and other constraints in increasing the supply of three principal sources of protein.

The first—fish—is constrained, in the short run at least, by

natural or ecological limitations. In an unmanaged state, the world's oceans produce only a certain amount of fish each year. The recent falloff in the growth in the world fish catch indicates that the existing catch is pressing against the limits for some species. It does not augur well for the future.

A second important source of protein is beef. Here two constraints are operative. Agricultural scientists have not been able to devise any commercially viable means of getting more than one calf per cow per year. For every animal that goes into the beef production process, one adult must be fed and otherwise maintained for a full year. There does not appear to be any prospect of an imminent breakthrough on this front.

The other constraint on beef production is that the grazing capacity of much of the world's pastureland is now almost fully utilized. This is true, for example, in most of the U.S. Great Plains area, in East Africa and in parts of Australia. Most of the industrial countries in which beef consumption is expanding rapidly are unable to meet all the growth in demand for indigenous resources. Either some of the beef, or the feedgrains and soybeans to produce it, must be imported.

A third, potentially serious constraint on efforts to expand supplies of high-quality protein is the inability of scientists to achieve a breakthrough in per acre yields of soybeans. Soybeans are a major source of high-quality protein for livestock and poultry throughout much of the world and are consumed directly as food by perhaps a billion people throughout densely populated East Asia. The economic importance of soybeans is indicated by the fact that they have become the leading export product of the United States, surpassing export sales of wheat, corn and high-technology items such as electronic computers and jet aircraft.

In the United States, which now produces three-fourths of the world's soybean crop and supplies more than 90 percent of all soybeans entering the world market, soybean yields per acre have increased by about 1 percent per year since 1950; corn yields, on the other hand, have increased by nearly 4 percent per year. One reason

why soybean yields have not climbed very rapidly is that the soybean, being a legume with a built-in nitrogen supply, is not very responsive to nitrogen fertilizer. The way the United States produces more soybeans is by planting more soybean acreage. Close to 85 percent of the dramatic fourfold increase in the U.S. soybean crop since 1950 has come from expanding the area devoted to it. As long as there was ample idled cropland available, this did not pose a problem, but if this cropland reserve continues to diminish or disappears entirely, it could create serious global supply problems.

Although there are substantial opportunities for expanding the world's protein supply, it now seems likely that the supply of animal protein will lag behind growth in demand for some time to come, resulting in significantly higher prices for livestock products during the remainder of the 1970's than prevailed during the 1960's. The world protein market may be transformed from a buyer's to a seller's market, much as the world energy market has been transformed over the past few years.

ALLEVIATING PRESSURES OF POPULATION GROWTH AND RISING AFFLUENCE

In this decade the overriding objective of a global food strategy in an increasingly interdependent world should be the elimination of hunger and malnutrition among that large segment of humanity whose food supply simply is inadequate. To be successful, such a strategy must be designed to alter existing trends in food production and population growth while seeking a more equitable distribution of food supplies both among and within societies.

The prospect of an emerging chronic global scarcity of food as a result of growing pressures on available food resources underlines the need to reduce and eventually halt population growth in as short a period of time as possible. One can conceive of this occurring in the industrial countries as a result of current demographic trends. In the United States, attitudes toward childbearing have changed

dramatically in recent years, and U.S. fertility has fallen below the replacement level of 2.1 children. If the recent precipitous decline in the U.S. birthrate continues, and this is a big if, it will bring U.S. population growth to a halt sometime in the 21st century.

Three European countries—East Germany, Luxembourg and West Germany—have stabilized their populations within the past few years. Indeed the growth of the German-speaking population of Europe—90 million people who live in East Germany, Berlin, West Germany, Austria and part of Switzerland—has very nearly ceased. Although this is a beginning toward reaching the goal of reducing or halting world population growth, it unfortunately is only a beginning in a world containing 3.8 billion people.

Many other European countries have relatively low birthrates and appear to be moving toward zero population growth. These countries—including Hungary, Scandinavia and the United Kingdom—plus the Soviet Union and Japan, could easily achieve a zero rate of population growth within the next decade or so, particularly if both policy-makers and the people put their minds to it.

In the poor countries, however, it is much more difficult to reduce growth rates within an acceptable time frame, at least as things are going now. For one thing, the historical record indicates that birthrates do not usually decline in the absence of a certain improvement in well-being—an assured food supply, a reduced infant mortality rate, literacy and at least rudimentary health services—which provides the basic motivation for smaller families.

Attacking Global Poverty

In short, it may well be in the self-interest of affluent societies, such as the United States, to launch an attack on global poverty, not only to narrow the economic gap between rich and poor nations, but also to meet the basic social needs of people throughout the world in an effort to provide incentives for lowering birthrates. Population-induced pressures on the global food supply will continue to increase if substantial economic and social progress is not made. Populations that double every 24 years—as many are doing in poor nations—multiply 16-fold in scarcely three generations!

Although the costs of promoting economic and social progress cannot be accurately predicted, there is reason to believe they might be less than imagined. UNESCO estimates show, for example, that in a developing country the cost of making a person literate is about \$8—slightly less for an adult, slightly more for a school-age youngster. Given a billion illiterates in the world, universal literacy would require an outlay of \$8 billion. If the funds could be mobilized and were spread over five years, the cost would come to \$1.6 billion a year. If the costs were allocated among the principal industrial countries, each would have to put out only a few hundred million dollars a year.

Similarly, the cost of providing a minimum nutritional diet for most of mankind may be less than commonly thought. In some ways the Chinese experience is instructive. Development efforts in that country have had a strong social focus, with overall economic growth rates being secondary in importance. Despite an unimpressive economic growth rate averaging below 4 percent yearly, the Chinese approach has apparently been successful in providing adequate nutrition and near-universal literacy, even though incomes per person average only about \$140 a year. And birthrates are declining steadily.

Following World War II, the U.S. government decided it would share its food resources whenever famine threatened anywhere in the world. As a result, the world has been spared famine caused by natural disasters. Given the level of affluence that exists in many nations today, the time is ripe to take another positive step forward, recognizing that it is both necessary and humane to provide people with a diet that at least meets minimum nutritional needs. In effect, better nutrition could mean lower birthrates by decreasing infant and child mortality and thus reducing the number of pregnancies required to assure the desired number of surviving children in families in poor nations.

Altering Consumption Patterns

As the world shrinks under the impact of advancing communications and transportation technologies and the continuing

integration of national economies into a single global economy, the contrast in food consumption levels between rich and poor countries sharpens. As indicated earlier, those living in the poor countries are sustained on 400 pounds or less of grain a year, while those in the wealthier ones require nearly a ton of grain. It is difficult to envisage a situation in which all of mankind could progressively increase per capita claims on the earth's food-producing resources until everyone reached the level now enjoyed by the average North American. Thus, thought should be given to how diets could be simplified in the wealthy nations in order to reduce per capita claims on the earth's scarce resources of land and water. What are the possibilities of substituting less costly, more efficient forms of protein for, say, beef?

Consumption patterns in the United States suggest that there are two broad approaches to reducing per capita resource requirements for food. One is to substitute vegetable oils for animal fat; the other is to substitute vegetable protein for animal protein.

Over the past three decades, vegetable oils have been extensively replacing animal fats in the American diet. In 1940, for example, the average American consumed 17 pounds of butter and 2 pounds of margarine. By 1971 the average American was consuming 11 pounds of margarine and 5 pounds of butter. Lard has been almost pushed off supermarket shelves by the hydrogenated vegetable shortenings. At least 65 percent of the whipped toppings and more than 35 percent of the coffee whiteners in the United States today are of nondairy origin. This pervasive trend has economic, ecological and nutritional advantages. It reduces both per capita food costs and per capita claims on agricultural resources, and it reduces the intake of saturated animal fats now widely believed to be a factor contributing to heart disease.

The widespread substitution of vegetable oils for animal fats in the U.S. diet over the past generation has reduced per capita claims on agricultural resources, but this has been more than offset by the simultaneous increase in beef consumption from 55 to 117 pounds. Stimulated by sharp rises in meat prices in late 1972 and early 1973,

attention is now focusing on the substitution of high-quality vegetable protein for animal protein. Technology for the substitution of vegetable for animal proteins has made considerable progress, mainly in the area of soya-based meat substitutes. The development of a technique for spinning soya protein into fibers, duplicating the spinning of synthetic textile fibers, permits the close emulation of the fibrous qualities of meat. Food technologists can now compress soya fibers into meat form and, with the appropriate flavoring and coloring, come up with reasonable substitutes for beef, pork and poultry. With livestock protein, particularly beef, becoming more costly, this technique is likely to gain a strong commercial foothold in the near future.

The first major meat product for which substitution is succeeding commercially is bacon. The soya-based substitute looks and tastes like bacon, and, while the extent of substitution for bacon is still small, it is growing. The substitute product has the advantage of being high in protein, low in fat and storable without refrigeration.

The greatest single area of protein substitution promises to be the use of vegetable protein to augment meat proteins in ground meats. Soya protein "extenders," as they are known, are being added to a variety of processed and ground meat products, frequently improving flavor, cooking qualities and nutrition as well as reducing prices. Soya protein extenders are already widely used in institutions throughout the United States, and limited supermarket sales to the public have also begun.

Although the average American already consumes nearly 1 ton of grain per year, either directly or indirectly, indications are that this could climb even higher in the years ahead. Projections of the U.S. Department of Agriculture show per capita beef consumption reaching 140 pounds by 1985, but a continuing rise in the cost of beef could alter this trend downward as consumers seek more economic substitutes. If the substitution of high-quality vegetable protein becomes as widespread as that of vegetable oils for animal fats, it is not inconceivable that, in the United States, per capita claims on agricultural resources could eventually begin to decline. A

combination of convergent economic and ecological forces and health considerations could lead in this direction.

SOME IMMEDIATE STEPS

In addition to the actions designed to ameliorate long-term pressures on food resources caused by population growth and rising affluence, the circumstances of the mid-1970's also argue for some specific actions to offset immediate pressures. If, as this analysis suggests, the world is moving from a situation of chronic excess agricultural production capacity to one of chronic scarcity, particularly of protein, a reassessment of the world food production potential may be in order. International competition for available food supplies could become much more intense than any previously experienced.

World Food Reserve System

These new circumstances call for serious consideration of the creation of an internationally agreed system of food reserves as a means of maintaining some order and stability in the world food economy. Just as the U.S. dollar can no longer serve as the foundation of the international monetary system, U.S. agriculture may no longer have sufficient excess capacity to ensure reasonable stability in the world market for food. A world reserve could be built up in times of relative abundance and drawn down in times of acute scarcity. In effect, the cushion that surplus American agricultural capacity has provided for a generation would be provided at least partially by a world food bank.

An important first step would be international adoption of the concept of "minimum world food security" proposed in early 1973 by A. H. Boerma, director-general of the UN Food and Agriculture Organization (FAO). Under the FAO plan all governments—exporters and importers—would be asked to hold certain minimum levels of food stocks to meet international emergencies. The governments of participating countries would consult regularly to review the food situation, judge the adequacy of existing stocks and

recommend necessary actions. International agencies such as the World Bank, the International Monetary Fund and the FAO would help poor countries to establish and maintain the reserve stocks necessary for self-protection against crop failures.

Any system of global food reserves, whether a single, centrally managed food bank or the proposed FAO plan of coordinated national reserve policies, would provide a measure of stability in the world food economy that would be in the self-interest of all nations. The world community also, of course, has a basic humanitarian interest in ensuring that famine does not occur in the densely populated low-income countries following a poor crop year—an assurance the affluent nations may be less able to provide in the future if the current system of autonomous, nationally oriented planning is allowed to continue without modification.

Cooperative Approach to Fisheries

A close examination of the extent of overfishing and stock depletion in many of the world's fisheries underlines the urgency of evolving a cooperative global approach to the management of oceanic fisheries. Failure to do this will result in a continuing depletion of stocks, a reduction in catch, and soaring seafood prices that will make those of the early 1970's seem modest by comparison. Prices of some table fish could double within the next few years. In the absence of cooperation, world fishery resources could dwindle in the same way the world catch of whales has over the past two decades. It is in this context that all nations have a direct interest in the success of the Law of the Sea Conference, which is being organized by the UN for late 1973 and early 1974. Among other things, delegates to the conference will deal with the need to devise an institutional mechanism for cooperatively managing global fishery resources.

The Potential of the Poor Countries

One of the most immediate means of expanding the food supply is to return all of the idled U.S. cropland to production. Over the

longer run, however, the greatest opportunities lie in the developing countries, where the world's greatest reservoir of unexploited food potential is located.

In those countries having the appropriate economic incentives, fertilizer, water and other required agricultural inputs, the introduction of new wheat and rice varieties has increased production. The jump in per acre yields in developing countries appears dramatic largely because their yields traditionally have been so low relative to the potential. But today rice yields per acre in India and Nigeria still are only one-third those of Japan; corn yields in Thailand and Brazil are less than one-third those of the United States. Large increases in food supply are possible in these countries at far less cost than in agriculturally advanced nations if farmers are given the necessary economic incentives and the requisite inputs.

When global food scarcity exists and the capacity of the international community to respond to food emergencies has diminished, a convincing case can be made for strengthened support of agricultural development in such populous food-short countries as Bangladesh, India, Indonesia and Nigeria. India and the United States, for example, have about the same crop area with many similar characteristics. If India's yield levels equalled those of the United States, its current annual cereal production would be 230 million metric tons rather than the present total of approximately 100 million tons. If rice farmers in Bangladesh attained Japanese yield levels, rice production would jump fourfold from 10 million to 40 million tons. Brazil, by doubling its present cultivated area, could produce an additional 22 million tons of grain even if its currently low yield levels were not improved.

A bipartisan legislative proposal has been introduced in the U.S. Congress in 1973 that would restructure the U.S. Agency for International Development to focus more sharply on solving the problems of the poor majority, and increase by 50 percent the agency's support for agricultural and rural development in the years immediately ahead. This proposal seeks to capitalize on the unique capacity of the United States to lead an enlarged effort to expand the

world's food supply and to spur rural development. If implemented, this strategem would enable the United States to respond to the most devastating consequences of population growth—widespread malnutrition and the threat of famine—by strengthening support for modernizing the processes and structure of agriculture in the developing world, and to provide more effective support for health and education services that reach the poorest majority and thereby increase the motivation for limiting family size.

Concentrating efforts on expanding food production in the poor countries could reduce upward pressure on world food prices, create additional employment in countries where continuously rising unemployment poses a serious threat to political stability, raise income and improve nutrition for the poorest portion of humanity (the people living in rural areas of the developing countries), and increase motivation for smaller families. If these efforts were to succeed, the countries most afflicted by population growth would simultaneously gain both additional time in which to cope more effectively with the demographic components of hunger and additional help with their efforts to stabilize population growth.

The urgency of the food problem is underscored by increasingly frequent reports of starvation in sub-Saharan Africa and of food riots in Asia. Solving the problem is a complex task—one that requires thoughtful analysis and determined action by both rich and poor nations. Assuring adequate food supplies at reasonable prices within individual countries may now be possible only through international cooperation. The disappearance of surplus food stocks and the return of idled cropland to production has removed the cushions that once existed as partial insurance against catastrophe.

Research Needs and Challenges in the Population Field

by Allan C. Barnes, M.D.*

Given the complexity of the problems of population control, the multifaceted nature of research needs and challenges is understandable. It is customary to classify research in the field into two types: biologic and social science; and it is the former which has drawn more attention. However, the social sciences are indispensable at every step in the design and conduct of effective programs of population analysis and control. Indeed, scientists, family planning experts and government officials are becoming increasingly aware that any successful effort to reduce fertility requires not only safe, more efficient methods of contraception, but also—and perhaps more importantly—economic, social and legal policies to encourage reduced family size.

Overall policy must be based on demographers' projections; social psychologists and anthropologists must analyze the human attitudes involved in the understanding and acceptance of fertility control; sociologists and economists are needed to evaluate the effects of population patterns on overall development. We can safely assume that a contraceptive pill taken by a woman in Kansas will have the

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same biologic effect when it is taken by a woman in Uganda. But the factors that motivate a woman in Kansas to swallow that pill will be very different from those which influence a woman in Uganda.

Research into a broad range of social science questions may also be the key to identifying and understanding the workings of socioeconomic and behavioral factors, and to formulating rational population policies in this nation and abroad. In 1971 the nine population units in schools of public health, whose directors constitute the "Population Club," were surveyed as to their priorities for future research needs. The survey found the following subjects listed in approximate order of the frequency with which they were mentioned:

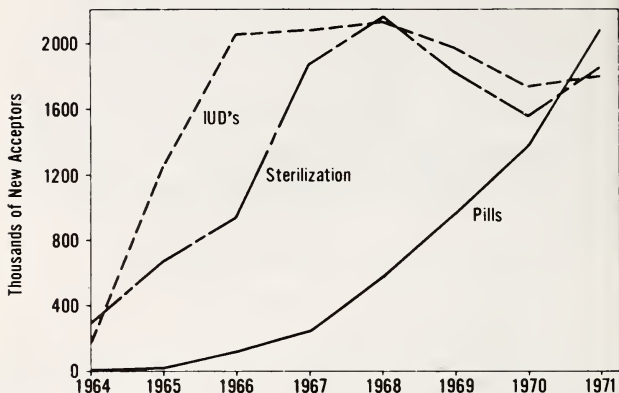
- Operational Aspects of Family Planning Programs
- Population Policies
- Reproductive Biology and Fertility Control
- Behavioral Aspects
- Demographic Data, Methods, Processes
- Implications and Consequences of Population Growth
- Education

The Need for Monitoring

Organized programs to reduce birthrates are attempts at massive interventions into complex sociobiologic reproductive systems which are not very well understood. Such programs, for continuing effectiveness, require monitoring with ongoing demographic analysis. This is perhaps the most basic type of social science investigation, and a continuing interaction must exist between the technical aspect of the program (contraceptive techniques chosen, channels of distribution, size and commitment of field staff) on the one hand and social science research on the other.

It is possible, armed with common sense and minimal research, to initiate family planning programs in most countries of the world and to achieve some success. For all countries have a large pool of married couples anxious to achieve a separation of the act of intercourse from the act of reproduction and quickly ready to accept any method presented in a medically safe and culturally inoffensive manner.

New Acceptors of Pills, IUD's and Sterilizations in Family Planning Programs in 35 Countries, 1964-1971



Source: SESA/BUCEN/ISPC, from data reported by Family Planning Programs in 35 less-developed countries (A1D).

An initial aura of success is usually attributable to the quick enlistment of this group into the program. However, after the initial success, social research or at least basic measurements of what the program is doing become important. In most successful programs there has been a regular interaction between research and program almost from the beginning.

This would indicate that there will always be a need for social science research—at least of this fundamental monitoring type. Unfortunately, in many programs research and evaluation are either not done or are grossly deficient on crucial issues. Some countries do not know the important characteristics of the program clients. Some record these characteristics initially but fail to follow up acceptors to see what happens to their birth control practices, fertility and well-being especially after they leave the program. Few programs do what

would be most useful: follow up adequate samples of acceptors and like numbers of nonacceptors through the crucial stages of family life.

Elaborate research efforts are not essential to the initiation of action programs but concurrent sample studies can be important for modifying policy and altering degrees of emphasis. It should be acknowledged, however, that this form of evaluation is often one of the most "sensitive" areas in social science research. Few people in the political or action agency areas want to have program deficiencies brought to light. In some cases all that is involved is a slight change in direction. In others, basically erroneous decisions may be revealed, wastage of money and effort may be uncovered. A program publicly touted as a "resounding success" may be shown to be marginal at best or even a failure. Important as this form of social science research may be, it is sometimes avoided because it is so revealing.

Beyond program evaluation and guidance we have additional research needs in the social science aspects of population stabilization. For most countries we do not have regular measurement either of fertility or of birth control practices to indicate broad trends, with or without a population program. In general, such measurements do not require highly sophisticated "basic" research, and their collection is a prerequisite for the formation of sensible policy.

In addition, relatively little is being done to learn what social and economic factors affect actual fertility, norms of family size and contraceptive practices. These studies in all probability have to be repeated on a country-by-country basis (or even separate regions within a country) because of the wide variability of an ethnic or tribal nature between different cultures. Nevertheless, knowledge of such basic relationships is important to guide allocation of effort and to judge the validity of arguments that family planning programs fail because the necessary social conditions are not present. Ultimately, if it becomes necessary to go beyond family planning, this knowledge could be even more important.

Approaches to a Research Strategy

It is not possible here to summarize in a few sentences a global strategy for needed research. However, a few comments are in order.

1. High priority should be given to measuring birthrates and their major components annually at the national level. Measurements from major strata and for local areas are important also. Experiments on how to do this are promising but still far from perfect. A serious sustained effort with adequate resources should produce increasingly better results as theory and experience interact.

2. Every major program should have access to a facility for doing sample surveys representing its acceptors and the whole population of child-bearing age. The immediate objective is to monitor the fertility levels of each age group in the childbearing years, whether in or out of program. The same system of surveys can be used for other studies in depth when the manpower is available. Building up both experience and bench-mark data will make it possible to collect information on short notice for the succession of problems that cannot now be anticipated.

3. Studies of the relation between economic factors and demography need much more attention. Economists are only beginning to work on demographic problems in any numbers. They are likely to concentrate on macroeconomic analyses which are important but not enough. One needs also to consider the microlevel, both for population and economic development: How are fertility, age at marriage, child spacing, etc., related to savings, consumption, personal economic desires and motives, etc? There are few such studies, but they are promising.

4. At least for a time, every country is likely to need its own data and some research. It is a misleading illusion, for example, that there is a constant formula which can convert numbers of pill or IUD users into the number of births averted by a program. The number of births averted by 100,000 IUD insertions depends on how many births those couples would have had without the insertions. This in turn depends (at least) on the following characteristics of the couples: their ages, their prior fertility and what they were already

doing about birth control. These facts are neither biological nor social constants: so there is no universal conversion coefficient. With enough studies in different kinds of places, one could develop ranges of probable magnitude which could be used when local studies are difficult.

5. In a few rather different countries the whole biosocial system affecting reproduction should be studied over time to provide measurements, models and basic relationships which can be tested and applied in other settings. This would require too much manpower to be done everywhere. It is important to do it in a few places if we take the view that this is a set of problems which will be acute for at least 50 years and present in various forms for centuries to come.

Biologic Research

Let us turn to consider research in reproductive biology and contraceptive development. By reproductive biology we refer to the complex chain of events extending from the production of the sperm through the first half of pregnancy (the period which might be applicable to contraceptive technology). With few exceptions, such research has been carried out in university centers and is nongovernment oriented in nature. But academic researchers investigating biologic sequences which might be applicable to population control techniques are by and large totally uninterested in the control of population. They are interested in asking fundamental questions and then seeking the answers, without regard as to whether or not such answers have an immediate payoff in the development of contraceptives.

During the past five to ten years, however, the pursuit of such research has produced many findings of potential applicability to contraceptive technology, and the dividends of the investment in reproductive biologic research have begun to be evident. Nevertheless, the basic infrastructure of our understanding of reproductive biology is surprisingly weak. There are great gaps in our knowledge in many areas and the unknowns loom larger than

the knowns. As with social science research, broad areas of need can be identified with greater ease than specific questions can be posed.

Surveying this field, it is evident that in a general sense what is needed is to interest investigators with specific research disciplines to direct their talents toward the study of reproduction. Thus many reproductive biologists are unskilled in the realm of contemporary immunology, while competent immunologists often ignore the field of reproduction. The molecular and cellular biologist, those concentrating on the fine details of membrane transport and many other research specialists must be persuaded to turn their attention to the unanswered questions in reproduction.

Indeed, this theme might be enlarged to say that what is needed is to give academic respectability to the study of birth control in the broadest sense. It still remains true that the academic world gives more status to the study of death control than to those investigations which might be applicable to birth control. Only a fraction of the research effort in departments of obstetrics and gynecology across the country is directed toward the study of the interruption or prevention of pregnancy. The main reason is that academic status and financial supports largely go to faculty members in those departments pursuing other types of research. But in a world that has a population doubling time of less than 30 years, perhaps our greatest and most pressing need is for a reorientation of the medical school curriculum committees and promotion committees. If society's needs are to be truly the interests of the university, then a high percentage of academic research should be oriented toward subjects pertinent to the control of population growth.

Research in Contraceptive Technology

By contraceptive technology we refer to product-oriented research, usually nonacademic in nature and customarily associated with commercial (in this instance drug companies) development. Under most circumstances it should be sufficient to list the areas of opportunity in this field and then assign them to the pharmaceutical industry for exploration. Easy as this summarization of the problem would be, it is no longer realistic.

At the present time, requirements by the federal Food and Drug Administration (FDA) for the approval of new contraceptives stipulate a series of studies which cost between \$8 million (the government estimate) and \$30 million. Having expended this amount, one faces the unpredictability of sudden withdrawal of FDA approval, or a Senate hearing on the cost of the medication. As a result, many drug firms have discontinued all research in the realm of contraceptive technology. As one expert has pointed out: "It can be expected that the interest of the international pharmaceutical industry will rapidly diminish during the 70's as far as the development of fertility controlling agents is concerned, unless a part of the developmental costs (e.g., chronic toxicity tests, clinical trials) will be defrayed by public money or by philanthropic institutions." The result is that industry—normally the agency which would be interested in applied technologic contraceptive research—is currently less of a resource than in other drug development areas (antibiotics, etc.), and public and private agencies are trying to fill this particular (and peculiar) gap.

Major Programs

There are at the present time five major programs to develop new methods of fertility control for public sector use. A brief review of these programs indicates both the extent of the research needs and the investment in trying to meet these needs:

1. The U.S. Agency for International Development (AID) population research program. It is divided into four areas: descriptive demography, analysis of population dynamics, family planning program operations research, and development of improved means of fertility control. The latter program in fertility regulation was launched in 1968; by 1972 a total of nearly \$30 million had been expended.

2. The Center for Population Research of the National Institute of Child Health and Human Development (NICHD). It carries out activities in four areas: biological research, including contraceptives; behavioral sciences research; institutional development, including manpower development and designation and support of

Population Research Centers; and dissemination of scientific information for the population field. The overall budget for 1972 amounted to \$40 million, of which \$28.2 million was earmarked for the biological research area. In the contraceptive development program, which was initiated in 1969, 11 major areas have been selected for applied research and development.

3. The World Health Organization Expanded Program of Research Development and Training in Human Reproduction, begun in 1971. It encompasses contraceptive development activities; basic research, directed research and training in reproductive biology; institutional development in the biomedical sciences related to the population field; a small supplies program; a seminar and workshop program; and a publication program. To carry out these activities, the Expanded Program relies heavily on a grant and contract approach similar to that of the AID and NICHD programs. Expenditures for these activities through 1972 totaled \$4.5 million, of which \$1.23 million was devoted to studies of prospective new fertility control methods at or near the clinical stages of testing.

4. The International Committee for Contraception Research (ICCR) of the Population Council, initiated in mid-1971. By the end of 1972 the program had expended approximately \$1.7 million, of which \$1.2 million was devoted to the development of 11 fertility control leads and to several probing studies of potential leads.

5. The International Committee for Applied Research in Population (ICARP), sponsored by the Population Council. It conducts applied social science studies in the family planning field. The program began operation in 1973 with a budget of \$250,000.

Development of New Contraceptive Methods

At least three of these programs (AID, WHO and ICCR) are actively considering how the methods under development can best be adapted to meet the needs of prospective users in developing country settings. While maintaining their roles and objectives as public-sector agencies, and operating within the limitations imposed by their respective patent policies, each program seeks to establish

working agreements with pharmaceutical companies in order to gain access to proprietary drugs for testing and development.

It appears highly likely that at least a half-dozen new methods of fertility control will emerge from these programs over the course of the next five years. It is safe to predict that none will be altogether free of drawbacks, but they are virtually certain to have some demographic impact for several reasons.

In varying fashion, each of the prospective new methods will be more "convenient" than currently available contraceptive methods; to some extent they will therefore increase acceptance by reducing the high thresholds of motivation that must be surmounted if one wishes now to limit family size. For the most part, the improved convenience of the new methods will take the form of improved modes of administration (weekly or monthly pills, precoital or postcoital pills, under-the-skin implants, long-term injectable contraceptives, vaginal ring contraceptives, out-patient methods of female sterilization) and/or a reduction in side effects, such as nausea, bleeding and pain. Some, such as contraception or reversible sterilization for the male, may provide fundamental new improvements over the existing technology.

In addition, the prospective new methods will offer a new range and variety of contraceptive options to users, and they may thus allow some of the cultural barriers to the practice of contraception to be circumvented. Also, their newness will initially stimulate interest and acceptance beyond the levels afforded current methods.

Possibly the greatest demographic impact of this next generation of contraceptive methods will arise from the degree to which they extend the period of use as compared to current methods. Because of their high effectiveness and increased convenience and acceptability and, in some cases, long-term action, it is anticipated that the new methods will exhibit higher continuation rates. Since the continuation rates and, consequently, number of births averted with current methods are low, the new methods do not need to be ideal in order to have a significant impact. High (but not perfect) continuation rates coupled with high effectiveness could increase the

average number of births averted for each acceptor of the new methods by two- or four-fold over that achieved with conventional methods.

Fundamentally, however, progress in contraceptive research means seeking methods which can more effectively reach the ignorant and the lowly motivated. If effectiveness in preventing births were the only criterion, one could stop with the introduction of the oral contraceptives, which block ovulation. But these medications have proven useful chiefly on a private patient basis. They require the ability to count the days, a level of motivation which is implied by the daily consumption of a medication; in other words, the currently available oral methods are not ideal for global application. Furthermore, a variety of methods will be required to be acceptable to all ethnic and religious groups.

It should be noted that the approximately \$23 million which the above outlined programs spent in 1972 do not approach the \$275 million annually invested (in this country alone) in cancer research. This statistic underlines the needs in research funding for population-related work. The Federal contribution has been more rhetoric than financing. Thus the Center for Population Research received \$40 million in 1972, but is scheduled for \$39.9 million in 1973 and \$39.2 million in 1974. In view of the rising costs of research, these figures represent sharp and serious cutbacks.

New Support Needed

The private sector has not shown an inclination to pick up this decline in support and perhaps cannot. If one looks in the Directory of Foundations, under the index which lists areas of interest, one does not even find Population listed. Under the heading of Demography, 11 foundations are listed, a statistic which needs interpretation. Not listed are such foundations as The Population Council or The Pathfinder Fund, which in general receive funds from other (usually foundation) sources and funnel them into population work. Also not listed are the American Friends Service Committee and Planned Parenthood, which obtain their funds from

multiple individual contributors for their population control activities. Included is at least one foundation (The Hugh Moore Fund) which succumbed to the effects of the 1969 Tax Reform Act and has liquidated its resources. Also included are "specialized" foundations such as Sunnen and Lalor with their interest in abortion. It is probably safe to say that of the 22,000 foundations in the United States, only three (Scaife, Ford and Rockefeller) have a significant commitment to supporting research in the field of population studies. The explanation for this statistic, in the face of the enormity of the problem, is not clear.

Whether in the social sciences or in reproductive biology or in contraceptive technology, the international community needs the clear recognition that research is desperately necessary and that it occupies a priority position. A more effective strategy must be devised for support in this area—from government, from official agencies, from the private sector. Rational man has benefited over the past century from the "knowledge explosion." But this knowledge must be applied to insuring that rational man will survive.

The Family Planning Movement and Population Control

by Julia Henderson*

No global issue in recent years has been as controversial as the population question. None has called for such dramatic shifts in the policies of many governments, such far-reaching amendments to the laws of many lands and such fundamental changes in the social behavior of millions of people.

While now at last there is public discussion and serious study of the complicated issues involved, the contrasts remain sharp and the human tragedies are poignant. Only a few months ago in Ireland, a mother of four lost her case for access to contraception pills to prevent another birth. In France, women rose up by the hundreds against the stern antiabortion policy and found leading doctors unexpectedly on their side. But in Singapore, the government introduced penalties for large families and gave housing priority to childless couples. And in China, by a miracle of organization on a massive scale, "barefoot doctors" deliver contraceptive advice and supplies directly to households in a concerted attempt to reduce the rate of population growth.

The mounting public concern that population growth is closely bound up with most social and economic development problems and

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that unplanned fertility is a threat to the quality of life has not been a spontaneous reaction to a clearly apparent world catastrophe. On the contrary, it has been the result of a deliberate effort over a number of years on the part of a few, but a growing number of thoughtful and sensitive people, to bring about an understanding of the nature and effects of demographic transition. Even so, strong opposition to family planning, together with appalling ignorance of population dynamics, would probably have been enough to defeat or delay indefinitely any forms of national and international action had it not been for the pervasive social changes which were, at the same time, creating a demand for better human conditions.

The massive migration of rural people to the cities and big towns throughout the world, bringing people into new relationships with each other, caused them and those responsible for their welfare to seek ways to respond to the pressures of urbanization. There were other significant changes, such as the dramatic fall in maternal and child deaths and the slow improvement in the status of women. Above all, there was the revolution of rising expectations, the growing aspirations of people everywhere for better education, better health and welfare services, housing and employment opportunities and a fair share of the world's resources.

Population, Development and Fertility

Although new issues are constantly emerging, there have in the past been two central themes in the population discussions. The first, and the most politically sensitive, has been the relationship between the population growth and economic development. Evidence from Europe suggested that the right economic conditions would bring about a fall in the birthrate, while contemporary experience in most developing countries in Asia produced overwhelming proof that economic and social progress could not be achieved without a slower rate of population growth.

The second theme was the relationship of national and global population growth to family size and individual fertility. While governments were urged to define their population policies in terms

of development planning, the objective of many people of influence in the private sector was simply to achieve a system of contraceptive services which would give individuals the human right to control their own fertility. The contribution that family planning programs make to the achievement of demographic objectives is still far from clear, but the welcome new trend of assessing development prospects in terms of social objectives has forced a merger between the two. Concern for individual and family welfare is inseparable from the desire to develop national resources in the interests of the quality of life.

Further complications beset every public and private organization which sought progress on population questions. Religious bodies were slow or reluctant to change their traditional pronatalist tenets, and this strongly influenced the capacity of governments to involve themselves in a search for solutions. In many societies, there were, and still are, strong traditions in favor of large families for once sensible reasons of economic security which are now no longer entirely realistic. Nations have sought strength in numbers and many groups in society look cautiously at any measures which could reduce their population.

In these circumstances, it is remarkable that so much progress has been made and that there is now not only widespread recognition of the population problem but much positive action to defuse the explosive situation of its consequences for the welfare of humanity.

How has this come about? It has been the good fortune of the writer to have been immersed in the struggle, first within the United Nations and now, as head of a worldwide voluntary organization, to be able to sharpen her perception and understanding of the contribution which has come and must continue to come from the private sector.

Throughout World Population Year in 1974, much will be said about the past and present roles of the UN. The development of a population policy at the international level has been one of the most remarkable stories in UN history. It is the story of a 180-degree

turnabout in public opinion and in national and international policies in less than two decades; the story of a subject which could not be discussed outside the family in many countries in 1945 and yet which now scarcely causes a ripple of debate in UN circles, except to emphasize its relationship to other aspects of development.

Development of the Family Planning Movement

In the effort to bring about this favorable climate, the voluntary family planning movement has been constantly in the forefront. It has challenged, country by country, the accepted public and political attitudes. It has shown a compassion for the plight of the individual and the family and has forced those in positions of influence to recognize the dramatic impact on social and economic conditions of the sudden, previously unperceived population explosion.

The voluntary movement is much older than any public attempt to face up to the issues of population growth. It has its roots in early suffragette movements and was dependent on the pioneering work of courageous women who risked injury and imprisonment to promote an unpopular cause. Margaret Sanger in the United States, Elise Ottesen-Jensen and others in Europe, and Shidjue Kato in Japan were among the fighters. The first birth-control clinic opened in Holland in 1881, and many began functioning in the early 1900's. In 1952, after earlier attempts had been thwarted by the disruptions of the two world wars, the International Planned Parenthood Federation (IPPF) was founded in Bombay with the national Family Planning Associations of India, the United States, Britain, Hong Kong, Germany, Holland, Sweden and Singapore as its first members.

The International Planned Parenthood Federation was not the first, nor indeed the only pioneer in the private sector. Many of the first contacts with interested doctors, university professors, community leaders and others in positions of influence were made by representatives of American-based organizations like the Pathfinder Fund, the Population Council and the Ford Foundation. There were

numerous conferences and study groups on a regional and international basis which provided convenient, noncommittal channels for the process of communication to begin between people of similar interests from many different countries.

While the philosophy, simply expressed by Margaret Sanger, was that "the first right of every child is to be wanted, to be desired, to be planned," the early pioneers were quick to recognize the implications for the family unit of food shortages, inadequate health conditions, lack of schools and jobs. The evidence they could glean on the emerging social and economic problems was used, in turn, to put pressure on the responsible institutions which could bring a change in public and political attitudes.

Often unpopular, not always law-abiding and steadily flaunting tradition, the volunteers have sought to demonstrate by practical example that if birth control education and services are provided, many millions of grateful people will take steps to control their own fertility. They have energetically lobbied in the corridors of the UN to draw attention to and force action upon the evidence that family size and population growth are related to every form of social and economic progress that the UN is attempting to foster.

This is not to suggest that the voluntary movement has been able to go it alone or that the acceptance of family planning is a simple question of information and services. Governments have probably been right to be cautious and to study carefully the implications for them and for the development and prosperity of their countries of any deliberate measures to control population growth. They have been greatly assisted by the UN, which has had to resolve painfully over the years its own role in endorsing and providing technical assistance in this field. The very process whereby the UN has arrived at the degree of recognition implicit in the decision to mark 1974 as World Population Year has provided the clarification of issues and the increase in knowledge which is a prerequisite for national decision-taking.

In the mid-60's the volunteers moved from the corridors of the international agencies into the other major forums of debate, as a



United Nations

Family planning in Indonesia: Midwife instructing village women on the proper use of an intrauterine loop device.

result of official recognition by the UN and its specialized agencies. It was significant that within two years the World Health Organization, the International Labor Organization, UNESCO, UNICEF and the Food and Agriculture Organization all gave tangible recognition to the contribution of family planning to their own efforts to improve living standards. At the same time several governments were being influenced by this mounting world consensus and were beginning to follow the example of India (1951), Japan (1952), Pakistan (1960) and Korea (1962) by establishing a national population policy and a program aimed at reducing the national birthrate. In 1960 there were family planning associations in 34 countries, and four governments (including Bermuda and China) had embarked on national programs. By 1965 some kind of

family planning had been introduced in 92 countries, and the number of committed governments rose to 10.

As the UN could act only at the request of a member state, the burgeoning private family planning organizations were almost entirely dependent on private fund-raising and IPPF support. Fortunately there had been for a number of years a persistent and successful effort in the United States to raise public funds for the international movement. The dramatic success of General William H. Draper, Jr. in raising the Victor Fund and later the Victor-Bostrom Fund was the first substantial shot in the arm for the struggling young voluntary movement.

An important source of immediate encouragement and urgently needed funds came at this delicate mid-century point from those same far-sighted governments which had pressed the cause in the UN. Having made substantial commitments to overseas development aid, Sweden, Britain and the United States turned to the IPPF to give tangible proof of their belief in the need for slowing population growth and speeding economic development.

For the IPPF, the significance of these gestures of official support lay not merely in the increased funds but in the implicit guarantee of continuing support. The IPPF could consolidate its base, extend its worldwide structure, strengthen its regional centers and plan ahead. It could recruit the expert help so urgently needed to develop its services and to explore solutions to the motivational problems that were becoming so acute; and it could begin to lighten the load on the corps of volunteers who had everywhere devoted themselves so competently and so selflessly to the cause.

In this period of rapid evolution, the voluntary structure of the IPPF was fundamental to its ability to adjust to changing circumstances and to monitor the diversity of needs which were felt in the member countries. Always an organization in which the periphery was more important than the center, the IPPF's image as an international body was formed from a synthesis of the views brought by the representatives of its regional councils to the governing body. Given the uneven pace of developments, the sharp

contrasts, for instance, between the widespread acceptance of family planning in Asia and the almost total official rejection of it in Africa and Latin America before 1966, it was not surprising that the volunteers faced some hard policy decisions and occasionally seemed to advance the international cause only slowly.

It used to be said frequently in the corridors of IPPF that the goal of the federation was to work itself out of business. Many family planning associations looked forward to the day when the government would take over their clinics, absorb their professional staff and record publicly the debt the modern program owed to their courage and persistence. Events have proved them wrong. Not only have some of the largest associations continued to run clinics on a massive scale but it soon became apparent that governments rely heavily on the private sector during their early experiments with a national service and count on the continuing efforts of the voluntary movement to get that service fully utilized.

What Role for the Private Sector?

What, then, is the most appropriate role for the private sector to play in the worldwide effort to increase family planning practice and bring down the birthrates? In many countries the most significant factor emerging from government involvement in family planning is the availability of public health facilities. In no country has it been possible for a voluntary organization to develop a nationwide clinic service alone. The association's clinics are pilot centers for promotion, training and the introduction of new approaches to the delivery of services. Thus, in a division of labor with governments, the association normally relinquishes its service role.

Experience has shown that this cannot happen suddenly and that governments must be helped to resolve the many problems of training, administration, distribution and coordination with other services which are essential to the efficient delivery of family planning services. Equally important is the interrelationship between affected government departments, which must exist if support for the program is to be real in terms of economic planning,

education of young people, community development, employment, housing, urbanization and rural reconstruction.

It is a miracle of national understanding if the persons of influence in all these sectors are brought at one time to the point of decision on population policy, planning and implementation of the family planning program. More often a farsighted government leader, with the favorable attitude of the Ministry of Health, will face many months of negotiation in order to reach agreement on budget, interdepartmental contributions, facilities, personnel and other resources. In these circumstances, the presence of the family planning association, in its continuing role as catalyst and pressure group, can be a vital stimulus to the program just at the takeoff point. This is a difficult stage which should not be underestimated and which causes the IPPF constantly to examine the contribution it can and should make in each country.

Once the program is on its way, the relationship between the public and private sectors changes and the family planning association assumes a complementary role, concentrating on information and education activities and retaining a few of its clinics for pilot projects, demonstration and training. It may often continue its campaigns to liberalize legislation relating to family planning.

In a few cases, national programs have been launched in countries where there has been no previous private sector activity of any significance. Later, these same governments have encouraged the development of the voluntary movement in order to draw community support for the program. In Tunisia, Morocco and Nicaragua, for instance, family planning associations came into existence several years after the official program began.

Public and private sector activities in the field of family planning tend to become mutually supportive, and experience is indicating some of the forms of partnership that can contribute most effectively to the program. A very strong influence on the association is the confidence it derives from official sanction for its work and from the presence or imminent development of service points and distribution channels throughout the country which can meet the needs of the people. These expose channels of communication which were not

earlier available or possible, and in this environment the association can pursue a wide range of information and education activities covering the mass media, group meetings, house-to-house visits, rural fieldwork, local clubs and other agents for motivation.

Examples of Cooperation

In the Republic of Korea the voluntary body, the Planned Parenthood Federation of Korea, came into existence in the same year as the government program. The activities of both have been conducted as a cooperative enterprise from the beginning. Information, education and communication activities are entirely the responsibility of the PPFK. The government trains the family planning workers and organizes the delivery of contraceptive services, operations for sterilization and, where appropriate, abortion. The voluntary federation, with an intricate branch structure of volunteers at the provincial level, mobilizes support for the program by lecturing to schools, parent-teacher associations, factories, trade unions and other community groups and by issuing widely in magazines and leaflets information about family planning, the sources of contraceptive supplies, population dynamics, population education and a range of related topics. The organization of a network of mothers' clubs in 20,000 villages has been an outstanding example of public motivation by a voluntary body.

In Ghana, where the government began a national program in 1969, the Planned Parenthood Association trains the fieldworkers whose job it is to direct potential acceptors to the nearest clinic which may be either a public or a privately run center.

An example from Latin America can be found in the Dominican Republic, where a government program has existed since 1968. An intensive campaign to spread family planning information by radio has been carried out for several years by the voluntary association. Recent studies have shown it to be highly effective in reaching rural people out of the range of the communication channels of the government program.

Training is another area where the private association can make an important, often continuing, contribution to the national effort.

In many countries governments have been more than willing to leave the responsibility for training to the family planning associations, recognizing that the long years of experience, the dedication of the workers and the high standards of clinic services are the best basis for this effort. Among the many examples is the model training center of the Planned Parenthood Association of Thailand, where doctors and other professional health personnel, as well as social workers and fieldworkers, are trained to take part in the government service. On a much larger scale is the nonmedical training program of the Indonesian Planned Parenthood Association. The government, requesting this assistance from the private sector, set a target of 3,000 trained fieldworkers by the end of 1973. To achieve this, the association operates one national, six provincial and several sub-provincial training centers. These centers are linked to demonstration areas which serve as field units for the trainees and as a testing ground for new community approaches to family planning education and motivation.

It is often in the national interest for the voluntary association to retain some responsibility for the provision of clinic services even when the health institutions have assumed the major role. These privately operated clinics can run trials of new methods, test new delivery systems and experiment in other areas of program improvement in a way which the more rigid governmental system may not permit.

Recently, in Colombia, the Family Planning Association took the initiative in offering vasectomy services for the first time. The government is expected to watch this experiment with interest and eventually to add it to the national program.

The government of Indonesia is also watching with interest the pioneer activities of the voluntary association in delivering educational materials and contraceptive services to Sumatra, Celebes, Borneo and other outer islands of the archipelago. In Iran the clinics retained under private auspices are experimenting with different opening times in order to test the best ways of meeting and stimulating the public demand.

Other innovative projects include experiments with new systems of distributing contraceptives outside the traditional clinic and health service structure, utilizing nonmedical personnel and exploiting already-established commercial channels. In Sri Lanka, the Family Planning Association was asked by the government to devise and administer a scheme for the commercial distribution of condoms. The products are sold cheaply through some 400 shops throughout the country, and the scheme may be expanded to include pills and other contraceptives which can be delivered direct to the consumer without medical supervision.

In many countries today, the Family Planning Association is represented on a national board or commission on which also sit officials from several government departments and representatives of other agencies contributing to the program. In this way, the experience of the older bodies can be constantly fed into the program planning, and adjustments can be made in the role of each agency.

But many governments remain uncommitted to population policies, firmly opposed to overt attempts at birth control and unattracted by the principle of personal decision as a human right. Many people with a deep concern for the health and welfare of parents and children have not yet understood the relationship between family size and the quality of life, nor have they assumed any significant degree of responsibility for educating parents in child-spacing as part of the routine administration of health care. The great majority of family planning associations in the private sector still struggle in an atmosphere of opposition, or at best only partial support. They attempt, with limited resources, to provide elementary services and to create awareness among influential people and political leaders of the need for population planning and service systems.

Looking Toward the Future

Today, member associations of the IPPF exist in 79 countries, and smaller, grant-receiving agencies are starting to work in another 20

countries. They derive their strength and experience from membership in an international federation. In recent years they have made increasingly heavy demands for financial support and technical assistance, and the IPPF has, in turn, imposed on them the heavy burden of detailed progress reporting, advance planning and professionalization. At the same time, associations have been encouraged to strengthen the volunteer participation in their national movements, to broaden the range of related areas of community development from which its advisors and policy-makers are drawn, and to seek the ideas and the cooperation of young people with whom the program will be mainly concerned in the future.

Through many problem-solving workshops, seminars and conferences, and through its participation in the activities of related international agencies, the IPPF has also sought to develop out of its own experience certain international strategies for action which are appropriate for the private sector to carry out in the future. In a preliminary look ahead to the period 1974-76, six major areas of effort have been identified:

1. To increase the awareness of peoples and governments about the national and global impact of population problems in order to stimulate commitment to the lowering of fertility.
2. To improve and expand fertility limitation services to all the people who need them.
3. To improve and expand training activities in order to create the personnel urgently needed for IPPF's increasing activities and for related programs.
4. To support research activities in the areas of operations, biomedicine and the social sciences.
5. To increase the effort at systematic evaluation of activities.
6. To improve the operational effectiveness of IPPF as a whole.

As the IPPF gazes into the future this year, it will draw much of its spirit of courage and perseverance from the greatly increasing support it has received from public opinion, from private fundraising efforts, from the increasing numbers of governments who annually support its work and from the new relations it has with the UN through the Fund for Population Activities.

U. S. Population Assistance to the Developing Countries

by Jarold A. Kieffer*

The developing countries in Asia, Latin America and Africa are becoming increasingly concerned about their rapid population growth and the numerous problems, current and future, that this growth either intensifies or generates. The greater attention to population growth problems results from the realization that despite considerable progress in expanding their total economic and social resources through development programs, the looked-for improvements in per capita income and average levels of living have tended to be diluted by record-high increases in population. The present rate of growth, a new phenomenon, has been built up through modern disease-control measures, improved nutrition and declining mortality, with continuance of habitually high birthrates. The results are felt not only in individual and family living but also in the ability of developing countries to accumulate savings and to train enough personnel for support of further development.

Although checking population growth obviously can be regarded as only a partial answer to development problems, 36 of the developing countries have launched family planning programs, mostly since the mid-1960's. These programs emphasize reduction of natural birthrates, promotion of planned parenthood, spacing of

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children for family well-being, and improved maternal and child health services.

U.S. World Concern

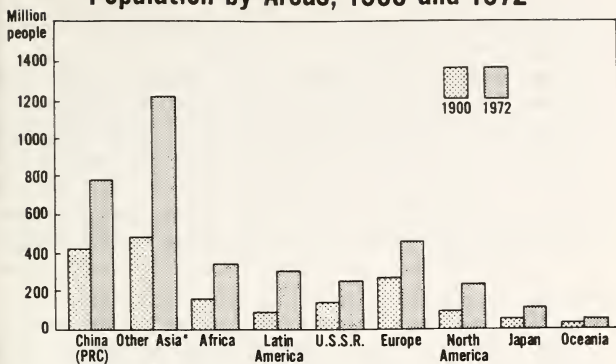
The interest of the United States in the population problem is both strong and many-sided; it is motivated both by humanitarian and development concerns. As a development agency, the Agency for International Development (AID) understands the critical relationship between population growth and the realization of development aspirations. Repeatedly, it has seen soundly conceived efforts frustrated because of unexpectedly large numbers of people among whom the gains from development has to be divided. Hoped for increases in governmental services were nullified. Adequately trained manpower was not available to mount expanded programs. Food supplies turned out to be inadequate, and revenues came nowhere near matching steadily expanding requirements.

These kinds of problems are widespread in the developing world, and today 84 percent of the world's population growth is occurring in the developing countries. Moreover, because of the youthful nature of their populations and their rapidly expanding numbers, many problems remain to be dealt with under difficult circumstances for years to come.

For these compelling reasons, AID, as a development agency, and the United States, as a nation interested in the development of the poorer countries, must continue to give major attention to the problem of rapidly expanding populations.

Likewise, the United States, in its quest for ways of decreasing world tensions, recognizes the direct relationship between population growth and the mounting worldwide consumption of resources, food and land. This is a triangular problem—it affects relationships between the developed and the lesser developed worlds, between neighboring developing countries themselves and between the developed countries. While slowing population growth will not of itself solve these problems, the failure to deal with it will certainly increase the likelihood of greater tensions, widespread

Population by Areas, 1900 and 1972



*Excluding Japan.

Sources: For 1900, by J. D. Durand. For 1972, SESA/BUCEN/ISPC, based on UN data (AID).

outbreaks of disease, famine, environmental disasters and even war.

U.S. Population Assistance Program

With the support of the President and Congress, U.S. funding for population assistance programs has risen from \$2.1 million in 1966, its beginning, to the authorized level of \$125 million for 1973. Cumulatively, we have invested almost half a billion dollars of government funds in population assistance to developing countries.

As a result, the United States has become the major source of foreign assistance to these programs. With the greatly valued help of other countries, the United States has both stimulated and collaborated with international organizations, educational institutions and foundations. Some of the latter were working in this field before AID's involvement: i.e. the International Planned Parenthood Federation, the Ford Foundation, the Rockefeller Foundation, the Population Council, the Swedish International Development Authority and the Pathfinder Fund. Independently, or

in some cases with major AID assistance, these organizations are increasing their efforts and often are able to collaborate to make their resources go further.

AID assistance is also helping to attract other resources to cope with the population problems of the developing countries. For example, AID provides the United Nations Fund for Population Activities with substantial funds. This new multilateral agency then receives matching donations from other donor countries, whose gifts collectively are beginning to exceed the U.S. donation. The same matching principle applies in the case of the International Planned Parenthood Federation, which encourages private programs all over the world.

The AID program has become a major supplier of contraceptive materials and other family planning supplies—currently to 70 countries. It is also an important resource for providing education and training for the many thousands of professional and sub-professional men and women assigned by their countries to population program work.

Support of major research programs, including development of new and improved methods of family planning especially suited to conditions in developing countries, is also one of the chief activities stimulated by AID. While this whole field is relatively new, interesting leads are already being pursued.

The U.S. leadership role, initially necessary for the inception of broad-based action in this field, is viewed as temporary only, pending a sharper focus of worldwide activities and the development of country program capacities for moving ahead without outside help. It is realized that burgeoning population is a world problem that will persist for a long time and affect the welfare of all countries. Clearly, the scope of the problem far exceeds the resources or assistance capabilities of any one nation. Therefore, it is believed that the longer-run role of this country and others lies in the direction of joining in and contributing to world action through organizations such as the UN, its specialized agencies, and other world and regional bodies.

Growth of AID Assistance

Early AID activity was concentrated on strengthening the population work of educational and research institutions, both in the United States and in developing countries, so that they could provide the expertise, manpower and leadership urgently needed. Grants were made initially to the University of North Carolina and to the Johns Hopkins University for establishment of population centers; to other U.S. and Latin American institutions for population studies; and to the International Planned Parenthood Federation and the Population Council for expansion of their activities.

Congress indicated its growing interest when, upon renewal of the Food for Peace program in 1968, it specified that part of the recipient countries' currencies accruing from the program's export sales of U.S. farm commodities could be used to assist family planning programs. Even in 1967 the pace was quickening. Country requests for program assistance increased. Reinforcing this growing interest was a UN resolution, signed by 30 heads of state during 1966 and 1967, which gave increased recognition to family planning by declaring that "the opportunity to decide the number and spacing of children is a basic human right."

In the wake of these developments, a new Office of War on Hunger was established in AID in 1967 to focus greater attention on helping solve problems of population, health, food and nutrition. It included a Population Service, later to become the present Office of Population.

An important step at that time was AID's decision to make contraceptives eligible for U.S. government financing in assistance programs, along with equipment for their manufacture. Also in 1967, AID issued its official publication, "Guidelines for Assistance in Population Programs," which continues today to direct its efforts in this field. These are among its basic precepts:

1. Help should be given to developing country programs in response to specific requests. The purpose is to stimulate and supplement a country's own efforts.

2. The programs assisted must be based on voluntary participation by individual citizens, with freedom to choose which available family planning method they prefer.

3. AID does not advocate any specific population policy for another country, nor any single method of family planning. But it does share and assist the development of relevant information which a country may need for informed policy and program decisions.

Support by Congress and the White House

These developments laid a foundation for spreading program action. To build on this, Congress in fiscal year 1968 enacted legislation for more help to these programs of the developing world. This was included in the amended Foreign Assistance Act as "Title X: Programs Relating to Population Growth." It authorized assistance for voluntary population programs in friendly foreign countries, for the population work of the UN and for similar endeavors by other organizations. Also, Congress earmarked \$35 million of the AID appropriation for use in carrying out the new authorization—a big jump from the \$4.4 million expenditure of the previous year. In succeeding fiscal years increased appropriations for this work have made possible the present multisided assistance to population and family planning activities around the world.

As this new work took shape, it received impetus from the White House. When President Richard Nixon sent to Congress his Presidential Message on Foreign Aid on May 28, 1969, he called for strong new emphasis on technical assistance in agriculture, education and family planning, pointing out that:

At least another decade of sustained hard work will be needed if we are to win the battle between economic development and population. But our assistance to voluntary family planning programs and support for the work of the UN and other international organizations in this field must continue to have high priority.

He also emphasized that in the technical assistance programs, including population, the "best of our American talent" would be asked to help, drawn from U.S. private firms, universities, colleges and nonprofit service groups.

Two months later, on July 18, 1969, President Nixon sent to Congress the nation's first presidential message on population growth. In it, he asked support for a double-barreled response to population growth, with intensified action both at home and abroad.

The President asked the Secretary of State and the administrator of AID "to give population and family planning high priority for attention, personnel, research and funding among our several aid programs."

The Assistance Program Today

How have the funds provided by the United States been used?

Through fiscal year 1972, 46 percent, or about \$180 million, has gone into supporting country and regional population and family planning projects. Country program allocations include: India, \$30 million; the Philippines, \$19 million; Pakistan, \$8 million; South Korea, \$6 million; Indonesia, \$6 million. Some 30 other countries in Asia, Africa and Latin America have received varying amounts of direct aid. Special attention has been given countries with the most pressing population problems, but all countries seeking bilateral assistance have been helped.

Fifty-four percent, or about \$206 million, has been programmed on an interregional basis, with much of it reaching more than 70 developing nations through international organizations. These include: UN population programs, \$50 million; International Planned Parenthood Federation, \$20 million; Pathfinder Fund, \$11 million; Planned Parenthood Federation of America (for overseas programs), \$7.5 million. Remaining funds have been channeled to domestic universities and other institutions for research, training and technical assistance.

A More Centralized Focus for AID Work

As the agency's work increased in this field, it became necessary to provide more centralized focus for the numerous activities involved. Therefore, in 1972 AID created the Bureau for Population and Humanitarian Assistance, headed by the author. Within this new bureau, the Office of Population, directed by Dr. R. T. Ravenholt

since its inception in 1967, was broadened to encompass all of AID's regional and central programming activities in the population field. With this kind of focus, a more complete view of both the population problem in the developing countries and the response to it is rapidly developing. To sharpen program emphases and direction, the work of the office was divided into six major fields of action. They are: (1) demography, (2) population policy, (3) contraceptive research, (4) delivery of family planning services, (5) information and education and (6) development of institutions and manpower.

1. *Demographic and social data.* Such data are much needed in the developing countries to make their population problems more visible and measurable, and, the implications more understandable. Hard facts are a "must" for the development of sound population policies and evaluation of program progress.

Assistance for demographic studies and analysis is now being given to Africa and to some Latin American countries where population programs are at a beginning stage and data are needed to point up problems and necessary action. The U.S. Bureau of the Census cooperates with AID in this work. Among demographic activities are the UN's 1972-75 African Census Program, in which 14 African countries for the first time will make a count of their population; and the 1972-77 World Fertility Survey, from which more than 30 countries will obtain data on the fertility of their populations.

2. *Population policy development.* Progress in meeting a country's population problem can take place most effectively when that government recognizes it as a problem and gives official support to finding solutions.

UN data show that only about a third of the developing countries have established official population policies and programs. Fourteen of them are in Asia, where family planning efforts have been underway longer than in the other developing regions. Eleven are in Latin America and ten, in Africa.

3. *Better means and knowledge of acceptance factors of fertility control.* To make birth a matter of "choice rather than chance,"

better ways to control fertility—suited to family planning use in the developing countries—are needed.

A vital consideration is that the contraceptive methods made available be practical and acceptable for use by women who frequently live under conditions of poor income, poor education, poor housing and poor access to family planning services.

At this time oral contraception—the pill—is turning out to be the most widely acceptable and effective method. During the last nine months, AID has purchased 52 million monthly cycles of pills for distribution in more than 70 developing countries. Much research, development and testing is taking place. This activity is exploring a wide range of contraceptive approaches—orals, IUD's, voluntary sterilization and other methods. Studies of promising new approaches involving the corpus luteum, antiprogesterin and prostaglandins also are in progress.

This work promises to be our most productive activity. Because it is a sharply focused effort, the costs have been modest—less than 10 percent of Title X funds utilized. AID's research work, in which commercial drug firms, foundations and others are participating, emphasizes the potential technological breakthroughs of broad application in the developing countries.

4. *Delivery of family planning services.* The delivery problem—that is, the problem of making family planning services readily available to women seeking them—is a barrier that must be surmounted, particularly in reaching the poor rural, remote and urban populations which also tend to have the greatest fertility. This is readily apparent when we look at where greatest population growth is taking place. Just nine countries, according to Bureau of the Census projections, will account for nearly two-thirds of the developing world's expected population growth during the 1970-80 period. These countries are: India, Pakistan, Bangladesh, Brazil, Indonesia, Mexico, Nigeria, Philippines and Thailand. Most of them have predominantly rural societies, though urban crowding is continuing to increase.

Reaching both the urban poor and the people in remote areas is a

huge challenge to educational extension and program administration. U.S. activities have helped to initiate and expand family planning services and to provide essential supplies, equipment, technical experts and training of program manpower. But the greatest challenge is still ahead.

The supplying of contraceptives to family planning programs has been, in itself, a most essential contribution. Since 1967, when AID removed contraceptives from its list of "ineligible commodities," it has provided approximately \$30 million worth of modern contraceptives to family planning programs. These are contraceptives approved for public use by the U.S. Food and Drug Administration and acquired from U.S. manufacturers at bulk prices. Orals have made up slightly over half the value of the contraceptives financed by AID, because of their appeal to younger women, their effectiveness and the ease with which they can be dispensed.

5. Information and Education. Population information-education is a basic requirement for spreading the adoption of family planning practices. Its role is to inform the people of the developing countries of the benefits of family planning and the methods and program services that are available for them. It also has a key part in establishing the broadening community and social acceptance of new attitudes and practices.

In every society the progress of fertility control is necessarily rooted in three basic determinants: (a) the individual, family and societal need for fertility control; (b) the opportunity of the people to obtain and use the supplies and/or services that are required for it; and (c) knowledge of both the need and the opportunity. Information and education activities of the programs disseminate the needed knowledge to the public as a whole, helping transform "need" and "opportunity" into participation.

These programs have received increasing emphasis in the last several years, with AID encouragement and support. Broader and better communication with the public, urban and rural, is an important need in all programs, though meeting it is difficult in many countries and program situations. Some of the national programs,

however, are giving particular attention to this—among them India, Pakistan and the Philippines. These are endeavoring to carry the family planning message to all people in their countries through active use of the mass media, leader conferences, selective mailings, speaker tours and information-education work by field staffs with individuals and groups at clinics and in villages. Substantial progress in such support is expected as the programs acquire additional operating experience. This will be stimulated by the training of information, education and communication personnel which is now going on at such places as the Communication Institute of the East-West Center, Honolulu, and at the University of Chicago.

6. *Institutions and manpower.* As population and family planning policies and programs have evolved, it has become increasingly important that there be institutions which can give continuing support—leading, guiding and sustaining the many types of effort required. AID has made funds available since 1965 to enable U.S. institutions to develop expertise in the population field and to share this expertise with institutions of the developing countries, and more recently it has given direct assistance to the foreign institutions.

By the same token, as population and family planning programs have expanded, so has the need for trained people to run them. Trained persons by the thousands are needed—doctors, nurses, nurse-midwives, medical social workers, teachers, home visitors and specialists in demography, statistics, census taking, communication and other related specialties.

Training for population program leadership and services has become a large volume activity in a number of country programs. During the past year more than 550 population program workers from over 30 countries were enrolled in AID sponsored training—programs both in the United States and other countries.

World Fertility Trends

Some indication of world trends in fertility can be drawn from countries that have complete registration of births. During the 1960's, among the 85 countries whose birth registration data have

been judged by the UN as complete for both 1960 and 1970, an overwhelming majority—74—indicate a decline of birthrates of 10 to 50 percent during the decade.

More than half of these countries with declining birthrates, however, are in the more developed regions of the world. Of the 41 less-developed countries included, 36 experienced fertility declines during the decade. These are mainly small countries—all 41 countries together account for only about 4 percent of the developing world's total population.

In addition to these developing countries, there is preliminary evidence of fertility control progress in a number of others as well (including the People's Republic of China). Many have adopted policies or programs to promote fertility decline. Although emerging data on contraceptive acceptance is often too incomplete to calculate its impact on fertility rates, it does indicate continuing improvement in contraceptive services and practice.

Progress to Date

Though much remains to be done for solution of the population and development problem, the programs' world spread and progress achieved thus far are highly significant. A number of factors, in addition to the measurable advances, provide a basis for modest optimism. Among them are the following:

The world increasingly is recognizing the need for and the rewards from slower population growth.

Many countries are removing or easing old laws which had limited public availability of natality control methods.

Key breakthroughs are being made in technology.

Larger resources are being made available for population programs.

International organizations are greatly expanding their work.

The task ahead, however, is large and difficult. Though millions are using family planning services, the scale of participation is not yet in the hundreds of millions needed for sharp reduction in birthrates. Also, there are still many developing countries which do not have broad and active programs, and some with no program at all.

official or nonofficial. Therefore, the bulk of the fertility control effort lies in the future.

The immediate challenge is to enlist the wider interest of leaders and of country peoples by the millions in the benefits and practices of family planning, coupled with energetic provision of effective means and opportunity for family planning adoption. The personal and family benefits of family limitation, as well as the societal needs, must be widely and convincingly explained, and the methods and services available made widely known. It is basically necessary that simple low-cost effective methods, supplies and services be made widely available to vast numbers, rural and urban, and that both people and leaders develop and encourage positive attitudes and desires with respect to the active practice of family planning in their lives and countries.

Continuing AID Support

In its totality, the challenge here is of global proportions, requiring global action. At the same time, the need for continuing U.S. support of population action is recognized. This support is being provided. AID believes its contribution can be most effective through continuing to draw the attention of developing countries to their problems of population-resource balance and the critical interactions involved. It also seeks to help them define workable program strategies, help them create the means for coping with these problems and encourage the increasing help of other donors. Certain special types of efforts now assisted by the agency through country-to-country aid and centrally funded projects will also be needed—particularly those involving innovation, problem solving, special research and improvement of program delivery systems.

As a development agency, AID recognizes the necessity for population action, worldwide and in individual countries. This need is clear and becoming more so year by year. The arithmetic of population growth, with each year's increase topping the one before, is a compelling force that we cannot neglect in considering and carrying forward meaningful development assistance programs in the 1970's.

World Population Year: The Need for International Consensus

by Rafael M. Salas*

As the preparations for World Population Year take shape, one major question has begun to dominate the scene—Is common *concern* on population sufficiently strong to lead to concerted *action* on population by the member states of the United Nations?

The response to this question may determine not only the immediate outcome of the Year and its main event, the World Population Conference, but also the future relationship between governments and the UN in regard to population matters.

At the present time, as the instrument of the world organization in the population field, the UN Fund for Population Activities (UNFPA) is providing the link between economically advanced and developing countries undertaking population programs. To date 61 nations have provided the resources which have allowed the fund to assist nearly 80 individual countries and in addition to undertake a number of regional and interregional programs which are serving groups of countries. These programs are based entirely on govern-

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mental decisions and vary as much in content as the countries themselves. The fund's function is to meet requests for assistance and to provide what is wanted. In conformity with this principle, over the last three years the fund has administered over \$70 million of assistance with strict neutrality in regard to the political, ethical, cultural and traditional attitudes of the recipients and with emphasis always on total respect for national sovereignty. More than that, it has kept in mind that external aid can only be a supplement to, not a substitute for, national effort, and the only people who can do anything about a country's population problems are the people of that country themselves. Consequently, its program is geared to providing missing elements and compensating for shortages until country programs can move on their volition.

The advent of World Population Year, however, has added a new dimension to the fund's responsibilities. By entrusting the preparations for the Year to the fund, the Economic and Social Council has placed it in the center of an international campaign which calls for the involvement of all nations not only as donors and recipients but as equal working partners in a joint effort to cope with population situations the world over.

This throws an entirely new light on the interdependence of countries in population matters as against their already established independence. Essentially it calls for acceptance of the not too palatable fact that, even though population activities are country based, population problems cannot be confined within national boundaries any more than major epidemics, and that in the wider view of the world population situation the concern of one country is the concern of all.

At this point you may be inclined to say, "We all understand that." But do we really see the problems of other nations as problems of our own? Is it indeed possible to obtain an international commitment on the part of national governments to carry out sustained responsible programs that can prevent many population problems from arising? Or can interest and action only be obtained in face of recurring crisis?

The difficulties in the way of getting this kind of commitment are pointed up in no uncertain manner by growing attitudes in several Western countries, in which declining birthrates are being matched by waning public interest in population matters even though serious and potentially critical national population problems still remain and though, as far as the global picture is concerned, the dangerous speed of population growth rates still remains unchecked.

The Motivation of Growth Rates

It cannot be denied that countries with rapidly expanding populations, such as the tiny 720-square-mile island of Mauritius, which is racing toward the million mark, have a much more powerful incentive to carry out vigorous population programs than those which still have sufficient breathing space. It is also true that under these conditions, it is much easier to identify the relationship between weight of numbers and social and economic ills and to move toward programs that will take account of the population factor as it affects all sectors of the nation.

As a result, nine of the most comprehensive programs being carried out anywhere are being launched with the assistance of the fund in countries where the pressure of population on housing, education, medical services, food supplies and job opportunities are tangible facts affecting the daily life of every man, woman and child. It is notable also that considerable attention is being paid in these programs not only to the promotion of family planning type programs but also to the establishment and strengthening of demographic institutions and the improvement of statistical and registration services so that future population trends and changes will not reach unmanageable proportions before action is taken to deal with them.

The threat of runaway growth rates is, in salesmen's terms, a "prime selling point" for arousing and holding public attention. As compared with a potential population explosion, such familiar population specters as maldistribution, too speedy urbanization, unemployment, aging population levels, environmental deterio-

ration and overutilization of natural resources, pale in importance in many economically advanced countries. Yet, in the long term, their impact on population stability of the industrialized societies and their contribution to international imbalance can be immeasurably disastrous if insufficient heed is taken.

To bring these contrasting pictures into focus and to encourage governments, while tackling their own population problems, to seek common grounds with others on which to build toward a unified approach to population matters, is the major task confronting World Population Year 1974 and the World Population Conference.

Talking It Over

In this discussion guide you will find discussion questions and reading references. These are suggestions only—a starting point to help you plan a study-group program or a classroom teaching unit.

Discussion Questions

How does continued growth of the world's population affect the environment?

Do you think that failure to achieve population stability in the 21st century will lead to environmental catastrophe?

What are some of the principal obstacles to bringing about lower birthrates in the developing countries?

What impact does economic and social development in the developing countries have on fertility rates? Why?

Do you think family planning programs offer an effective way of slowing down population growth? Why or why not?

How important is the factor of motivation in family planning? How can couples in the developing countries be motivated to practice family planning?

What are the major factors accounting for the increasing world demand for food?

What are some of the constraints on expanding the world's food supply?

What long and short range measures do you think the United States should take to expand the world food supply and to prevent local famines?

What are the major social science and biologic research needs in the field of population control? Do you think more government funds should be provided for research?

Why do you think the private international planned parenthood movement has played such an important role in stimulating efforts to slow down population growth?

Do you think AID's approach to the population problem is sound? If not, what policies would you recommend?

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